

MODEL CAR *Science*

JANUARY 1971

The 'Cuda Dragster -



By Don Emmons (See page 30)

FOR MASTER
MODELERS:
The Ferrari 512
"Daytona"
(see page 38)



IN THIS ISSUE - A WILD NEW CONTEST!

ALSO IN THIS ISSUE:

**Aerodynamics in
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4/Model Car Science

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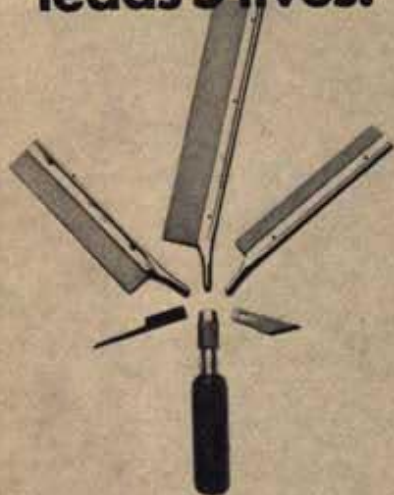
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THE ART OF SCRATCHBUILDING

MANY POTENTIAL SCRATCHBUILDERS with whom I've talked have asked the same question: "What about wheels and tires? How do you go about making them by hand?"

I'll admit, quite candidly, that wheels are NOT easy to scratchbuild. In fact, "store-bought" wheels are acceptable on models entered in the scratchbuilt classes at International Association of Automotive Modelers concours d'elegance. So let's look, first, at some possible sources of ready-made wheels.

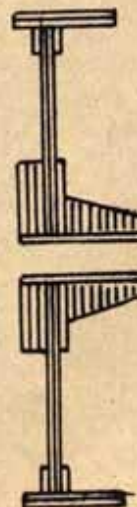
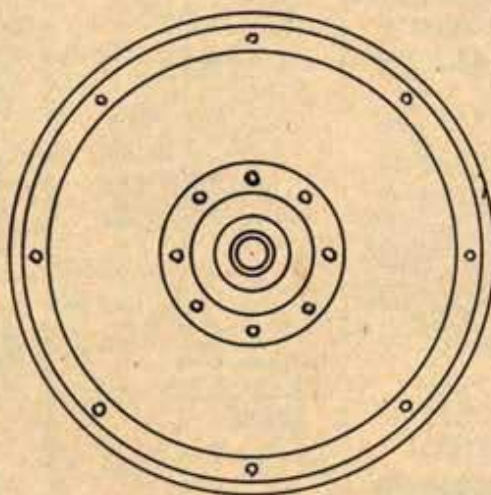
When slot-racing was in its heyday, a vast assortment of presentable wheels — albeit in a limited number of sizes — was available in any slot-racing shop or by mail from various sources. These ranged all the way from the veritable "Rolls-Royces" of wheels — Russkit's chrome-plated wire-spoked jobs in 1/24th scale — down to very simple disks that could be reworked to suit your prototype. Some of these wheels, and tires to fit them, are still listed in Auto-World's catalog; you may also find them lurking under layers of dust on hobby-shop shelves.

Or, consider the vast multitude of model car and truck kits now on the market. Each one of them contains a set of wheels and tires (in fact, some

contain several sets, for customizing). Most kits are inexpensive, so you can buy one, dig out the wheels and tires, and throw away the rest (or save it for spare parts). For example, if I were going to do a 1/24th-scale scratchbuilt model of the Bugatti Type 40, Type 55, or any of the others with those flat-spoke Elektron alloy wheels, I'd surely use the wheels and tires from Monogram's Type 35B Bugatti kits. With those available, there just isn't any point in trying to "roll your own." Few kit manufacturers will sell kit wheels and tires separately, but you might drop them a line and see what you can dig up that way.

There's another way. The toy counters of the 5 & 10¢ stores (why doesn't someone update the common name of those emporiums to "25¢ to \$1 and up" stores?) are loaded with toy cars and trucks, many of which have presentable wheels. At least, they'd be presentable with a little paint and, sometimes, a minimum of rework. Or perhaps one of your children, or some child you know, will have a discarded or forgotten toy — broken or intact — that you can "liberate." Look around you: wheels are everywhere!

But maybe you're a purist and you just *have* to make your own wheels (or maybe you just can't find any that are suitable for your project). Well, you DON'T NEED A LATHE to make your own. Do you have an electric drill? If you don't, you should, especially now that usable ones can be



How to make one type of disc wheel from cardboard rings and discs. Build up rim on round object, using two layers of strip. Hub is assembled on brass tubing, then sanded smooth and coated with plastic putty or plastic wood. Make bolt heads by indenting from REAR of stock with ball point pen, before assembly.

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1. Sales through dealers and carriers, street vendors and counter sales		
2. Mail subscriptions	12,211	12,982
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D. Free distribution (including samples) by mail carrier or other means	547	554
E. Total distribution (sum of C and D)	98,038	98,635
F. Office use, left-over, unaccounted, spoiled after printing	636	469
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January 1971/7

SCRATCHBUILDING

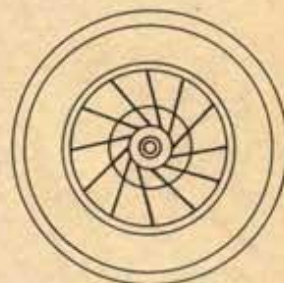
purchased in discount stores, mail-order outlets, and elsewhere, for less than ten bucks. Make or buy a cradle to hold your drill horizontal, and clamp it to your workbench or table. Now, you have a lathe of sorts. You'll need one more thing — a fair-sized block of wood (or a sturdy wooden box) high enough to support a tool approximately level with the center-line of the drill.

Take some white pine, basswood, or even hard balsa of sufficient thickness and from it, cut four (or five or six) circles a little bit larger than the wheels are to be. In the center of each disc, drill a hole that will just accept a 1/4-20 stovebolt, screw a 1" or 1-1/2" bolt into one of them, lock it with a

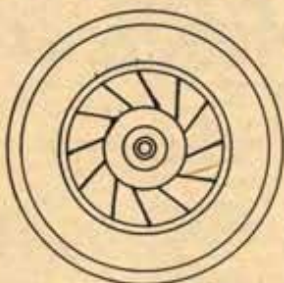
nut on the back side, and chuck it in the drill. The job, now, is to "worry" that disc into a reasonable facsimile of a wheel while the drill spins it for you, using chisels, files, sandpaper, or what-have-you. Yes, it will take practice! Yes, your first attempt(s) may not turn out too well. But, after you've messed up a few discs, you'll come up with a decent-looking wheel and all you have to do is make three (or four or five) more. (NOTE: Use a 1/4-20 bolt for 1/16th-scale wheels, an 8-32 for smaller ones.)

CAUTION: A little prudence is called for. If the tool catches on the wood, it may go sailing across the room or somewhere else, it shouldn't. Take light cuts, against

Spoking sequence for 24-spoke wire wheels



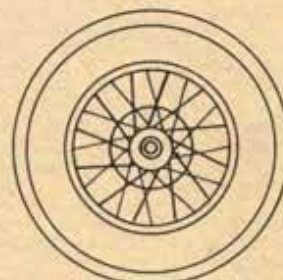
3. Insert all spokes in front row, sloping to left.



1. Insert all spokes in back row, sloping to left.

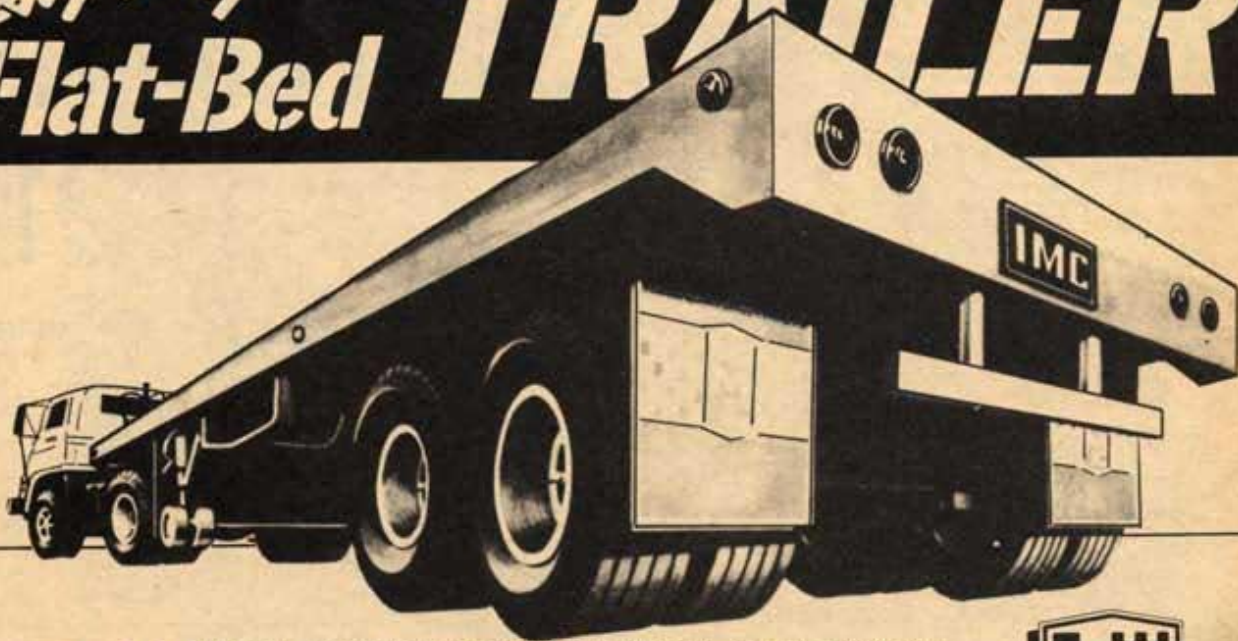


2. Add spokes in back row, sloping to right. Position midway between left slope spokes.



4. Add spokes in front row, sloping to right, same as in rear row.

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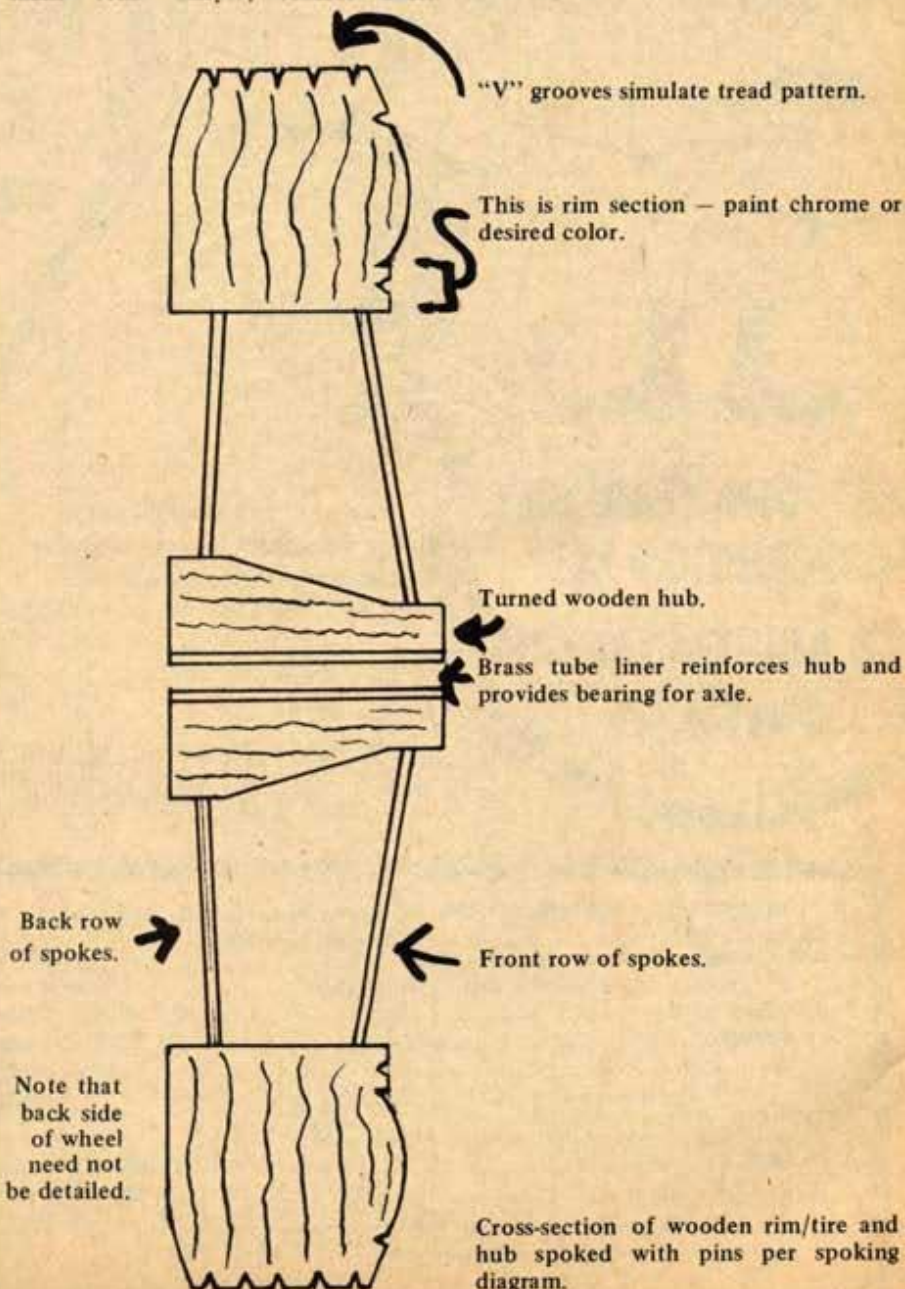
the direction of rotation, whether using chisel, file, or sandpaper, and hold the tool so that, should it catch, it can slip through your hand and away. Don't stand in front of the edge of the spinning disk, but off to one side, out of the "line of fire."

When you get to be an expert at making wheels by the foregoing method, switch to hardwood (maple and birch are ideal). You'll get a smoother result, and this type of wood machines more cleanly, with less fuzziness and chipping.

Wire wheels? Well, Rex Hays' book, "Motor Modeling" (mentioned in this column, MCS, August 1970 issue), explains one reasonably simple method of making them. Or, you can turn tire/rim assemblies as above; then make some simple, conical hubs.

Fasten these down on a board, cut the heads off a bunch of common pins (for 1/16th scale, bank pins or "tills" for 1/24th or 1/32nd). Pick up one beheaded pin at a time, using needle-nose pliers; push the point into the rim and pull the butt end back into the hub. As shown in the accompanying drawings, I use 24 pins per row (12 slant to the left, 12 to the right) or 48 per wheel. Spoke positions should be marked off on the inside of the rim before you start.

There are other, more exotic means of making wire-spoke wheels. For example, one chap I know trims the plastic spokes or disks out of kit wheels and re-wires them with bits of copper wire heated so that they melt their way into the plastic. Another lines his tires with brass or copper shim-stock, makes a hub out of solder built up on a brass tube, and solders



individual copper-wire spokes in place. We've even heard of using the "straws" from a plastic broom, cutting them to length and cementing them to a kit rim and hub prepared as above.

The best way, but the most difficult, is to turn a rim from brass, drill for spokes, and use a hub with grooves to accept thin wire. The wire is "laced" between rim and hub; a thin coat of solder finishes the job. You WILL need a lathe for this, obviously, since brass requires regular machining methods.

Wood-spoke wheels can be built by sawing out a disc of thin plywood and cutting away the sections between the spokes with a jewelers saw. File the individual spokes to shape, then add a rim of cardstock sized to fit your tires (or make a rim/tire as for the wire-wheel method described above). Another method employs individual spokes cut from birch dowel stock, cemented between rim and hub held in a jig (fastened to a board).

Cardstock, that easily-worked and probably most universally useful of all materials, can be used for hub and rim details on wheels produced by any of the means we've described. Some types of wheels (e.g., Bugatti and regular-spoked, disc, etc.) can even be made completely from cardstock, laminated in layers for strength.

In some cases, the brake-drums are best made integral with the wheel and/or hub. Finned drums can be built up from discs of plywood and slightly larger discs of card or metal; they might also be sawed from an old broom-stick of appropriate size, or a large birch dowel.

You can see, now, that wheels aren't the obstacle you might have thought they were. Or, for that matter, are other "round" parts, such as headlamps, horns, etc. All it takes is a little care and a little ingenuity, and you'll be turning out bits and pieces you'll be proud of!

Incidentally, a publication which may be of interest to you really serious modelers, is *Miniature Car Collector*, a monthly newspaper published by Pacific Publishing Group, P.O. Box 1821, Thousand Oaks, Calif. 91360. The paper is devoted to beautiful models of trucks, farm vehicles, die-cast collector cars ("MATCHBOX," etc.) and classic cars. Very interesting, at \$6.00 per year, (\$7.00 for foreign). Foreign (or domestic, for that matter) airmail service is not offered. I believe you'll find the paper interesting.

Next issue, we'll take a look at the powerplant of our scratchbuilt car. Despite the complex appearance of the automobile engine, it's relatively simple to turn out a convincing miniature.

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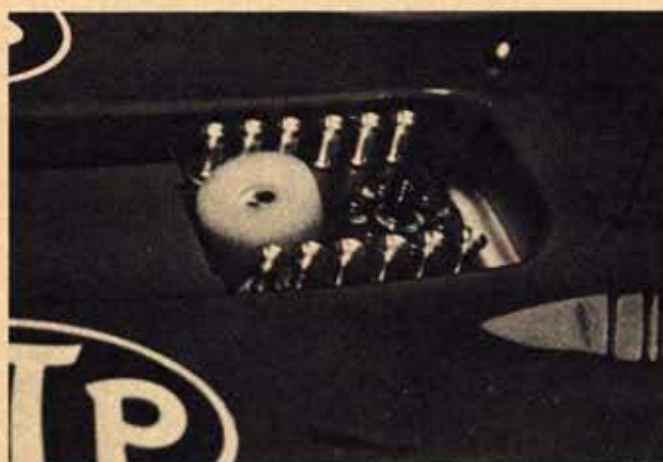
Two funny cars: The Camaro and Mustang. The Trick Truck. And the Wild Superbird.

Don't miss them. They're at your favorite hobby counter right now. Still \$4.

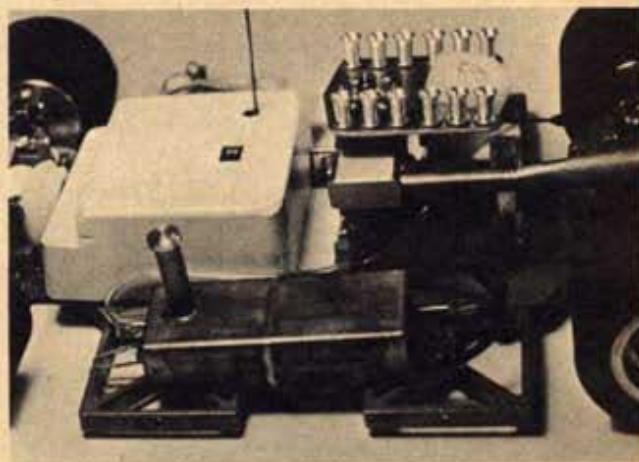
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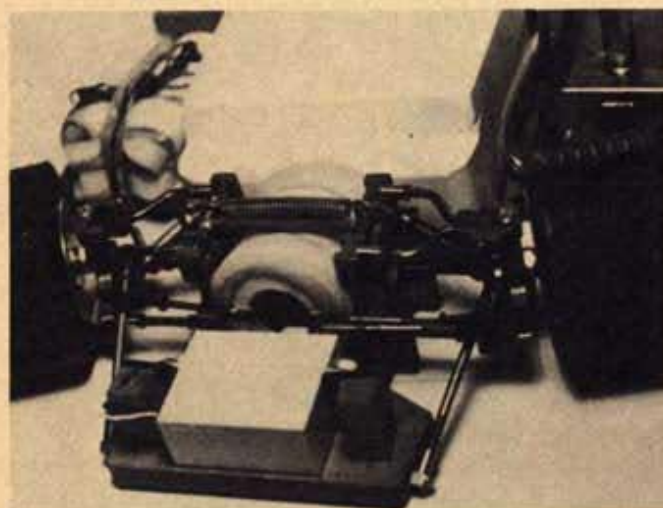
R/C MODS PART III



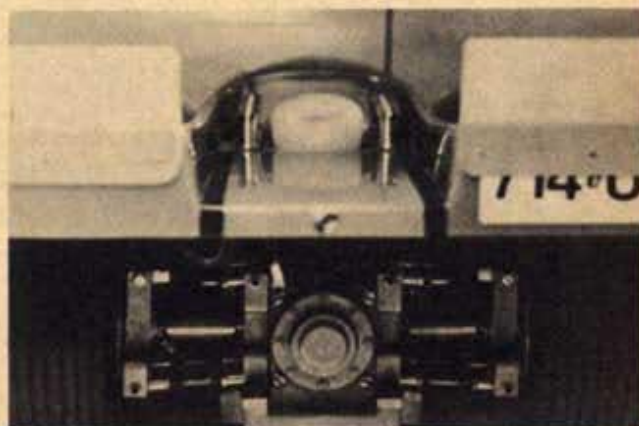
The air filter by Associated Electric is excellent — efficient and inexpensive. It comes with ten extra foam cartridges.



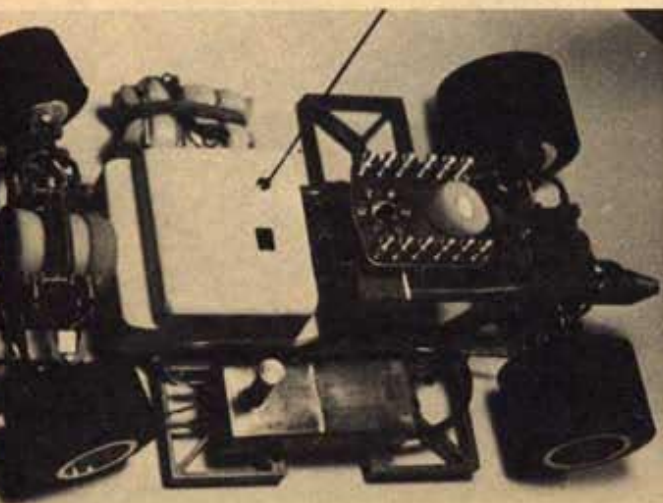
The gas tank uses a long tube and a turned gas cap.



Examine the front detail . . .

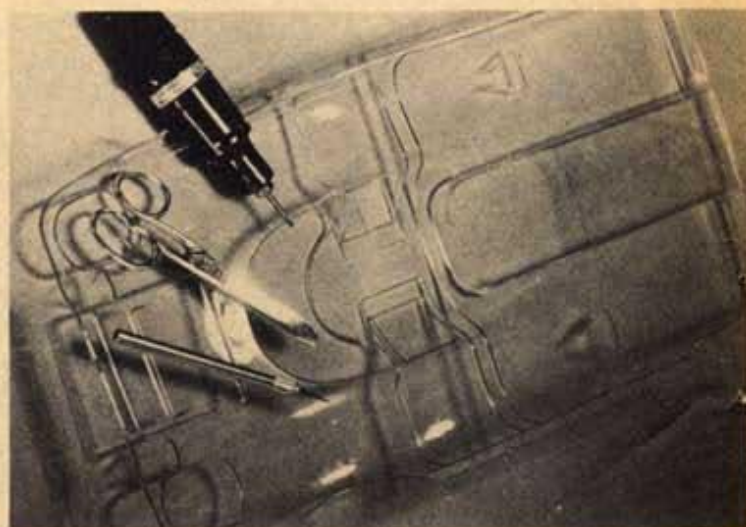


. . . and the rear.

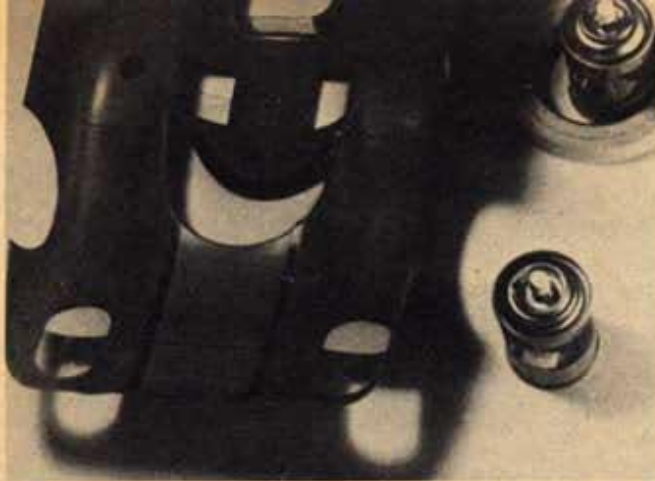


Check the radio to be sure everything is functioning correctly.

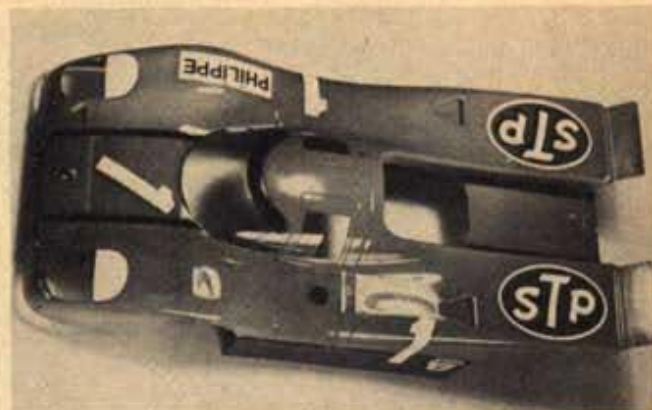
14/Model Car Science



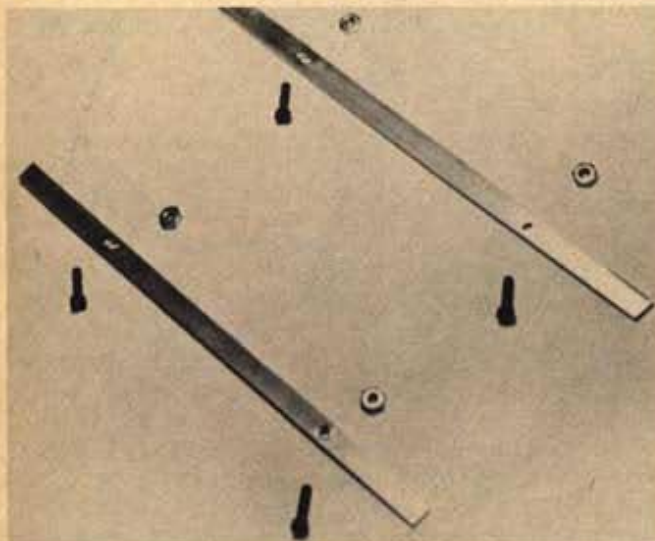
To do the final trimming on the body, you'll need an X-Acto knife, scissors and a Dremel Moto-Tool. (The Moto-Tool is optional, of course, as you can always do it — but slower — by hand.)



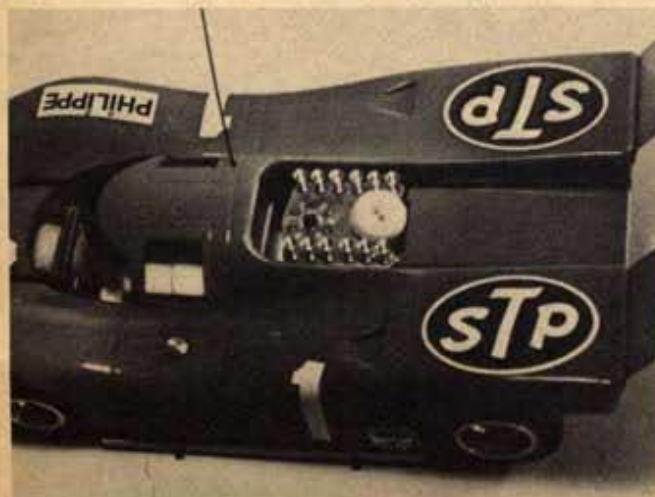
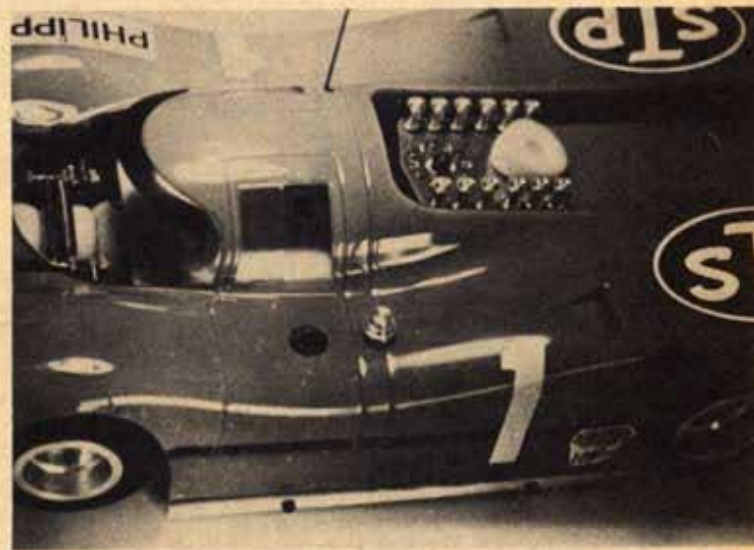
Cleanse the body with warm water and soap. Rinse thoroughly. When dry, use No. 600 sandpaper and lightly sand the entire inside of the body, with the exception of the window surfaces. Wash and dry again. Then mask off the areas you don't want painted and spray with lacquer paint only. Do NOT use enamels. The correct John Wyer colors for the Porsche are pale blue and orange.



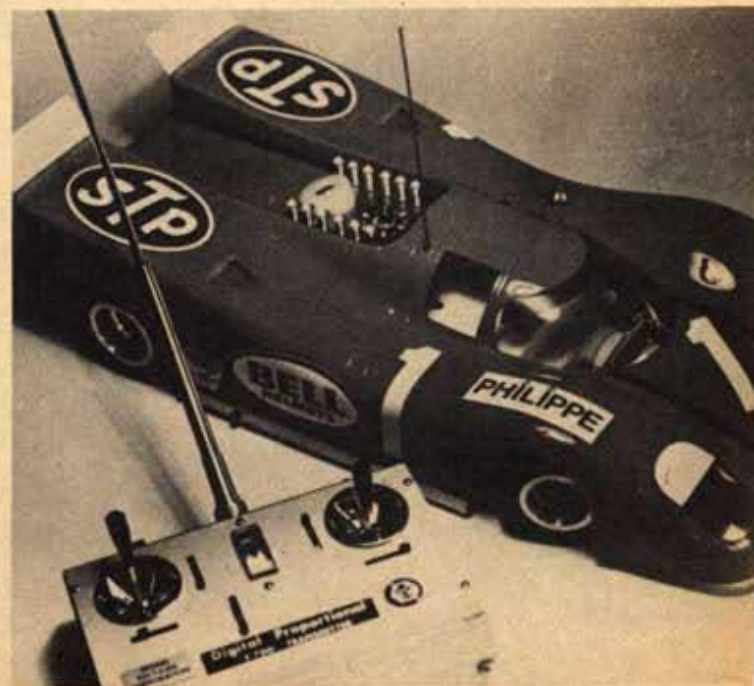
The blue and orange sections are painted in two different operations, of course, masking the previous section off after it has thoroughly dried. 1/8 scale decals are extremely scarce, and you'll just have to rummage. Usually you're forced to use decals from some of the larger scale static kits, such as MRC-Tamiya.



Cut two pieces of 1/8" thick aluminum and drill holes corresponding to the chassis side rails. This will hold the body better, reinforcing it and enabling you to pick the car up by the sides. Use "Allen" screws to secure the body to these rails.



These spoilers are riveted to the rear of the body to help the roadholding.



Revell's Porsche 911 can be converted into a slick looking rallye car with very little effort.



THE RALLYE KING

IT'S A PORSCHE, OF COURSE — BY REVELL

At long last there is a new model that has appeal to many different types of automotive modelers. It was a sad day indeed when Revell discontinued the old Porsche Carrera, but they have more than compensated for it by introducing the Porsche 911 (No. H-1215). In this model, you have the option of opening doors, or a solid body with an opening deck lid.

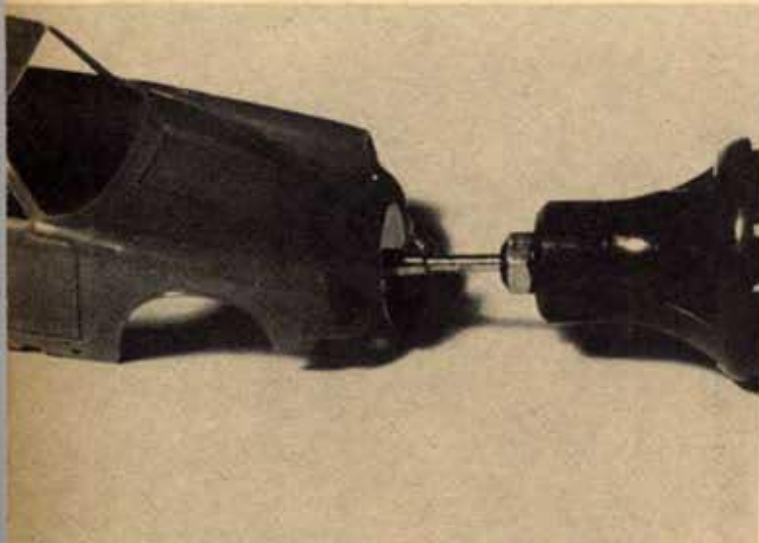
The modeler has a wide choice in modifying this car. A small displacement Chevy V-8 is almost a perfect fit in this jewel. The engine could come from the Orange Crate kit. A wild mid-engined dragster is also feasible by installing a blown Hemi from the Miss Deal kit, just forward of the rear axle so that it sits in the back seat. You can also build it

stock or modify it for rallye use as we did on our kit.

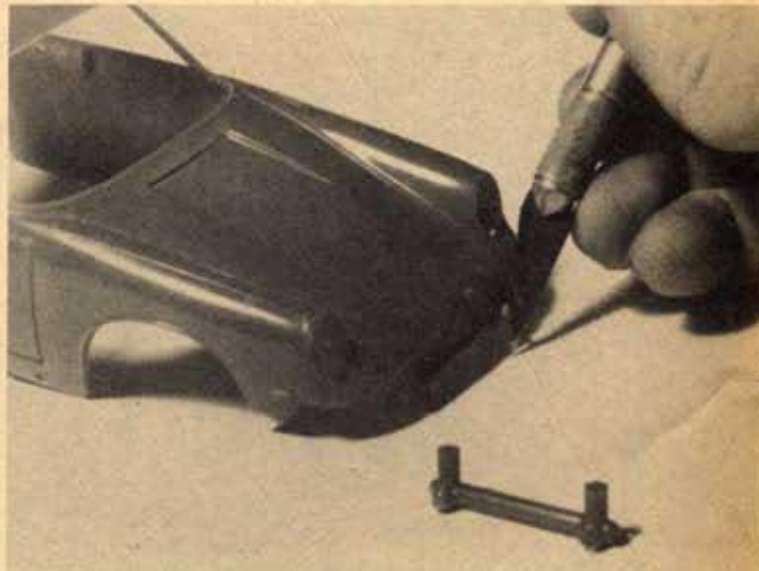
The V.W. 3-in-1 kit, No. H-1264, has several parts suitable for a rallye car, including fiberglass bucket seats, Empi roll bar, Carello driving lights, Empi exhaust and offset wheels. When finished, you'll have a model that is very similar to real Porsches that clean up in Europe every year.

We opted to use wire wheels for looks and a set of old Dunlop tires, but the fat tires and Empi wheels would look just as good, if not better. Try building a Revell Porsche 911 yourself and send us the pictures when it is done. We'll print as many as possible in the Model of the Month section.

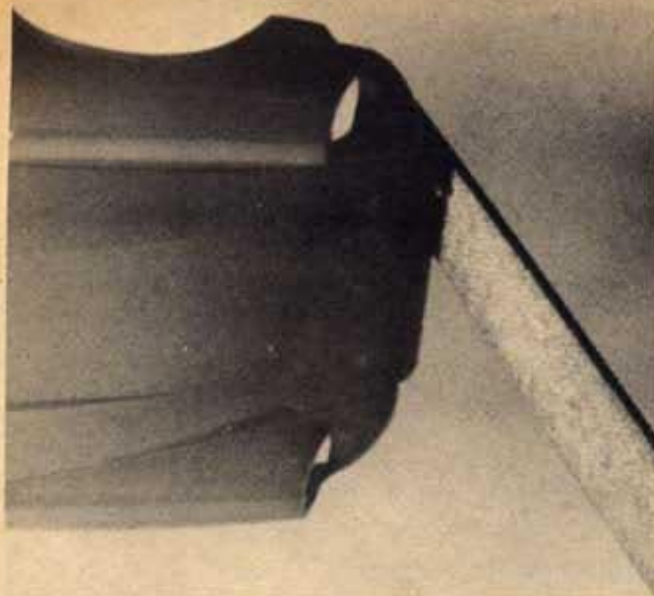
By Brick Price



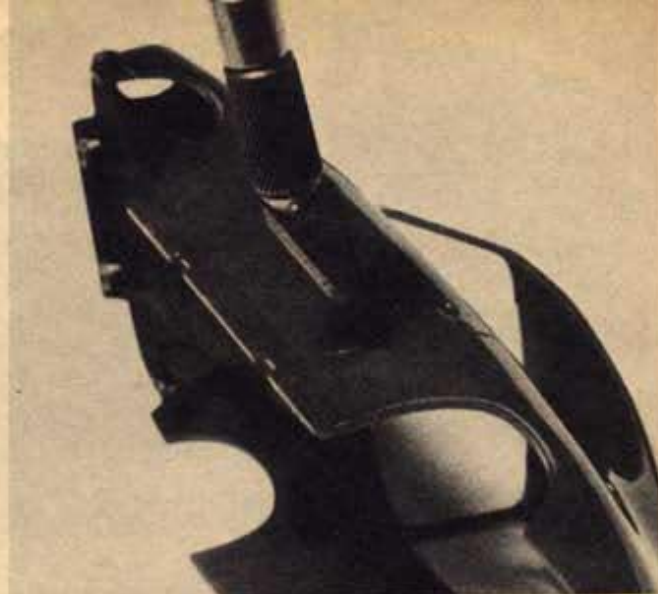
Never break parts off the plastic tree because you will invariably leave part of the model on the tree. Cut the scrap plastic off the body with a razor saw.



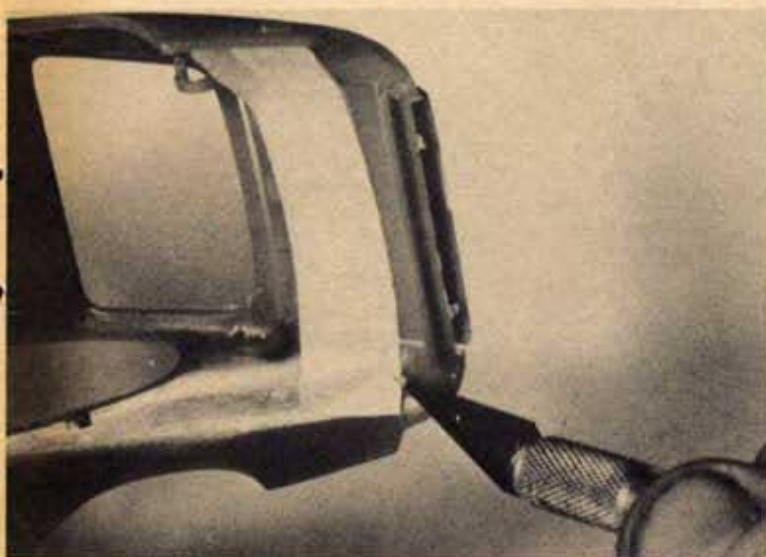
Trim off any remaining plastic with an X-Acto knife and a No. 11 blade.



Smooth out the cut marks with a file, then finish off with Flex-I-Grit sandpaper.



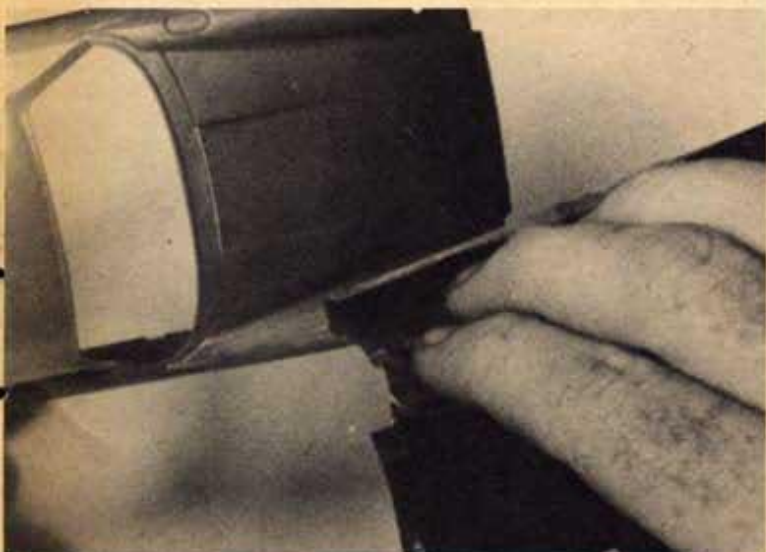
As mentioned before, the doors can be "opened" with an X-Acto knife. Follow the door-line using several fine cuts until it opens easily. Clean up any burrs with a Swedish file.



It's much easier to obtain an even coat of paint on the body parts if you tape them in place first.



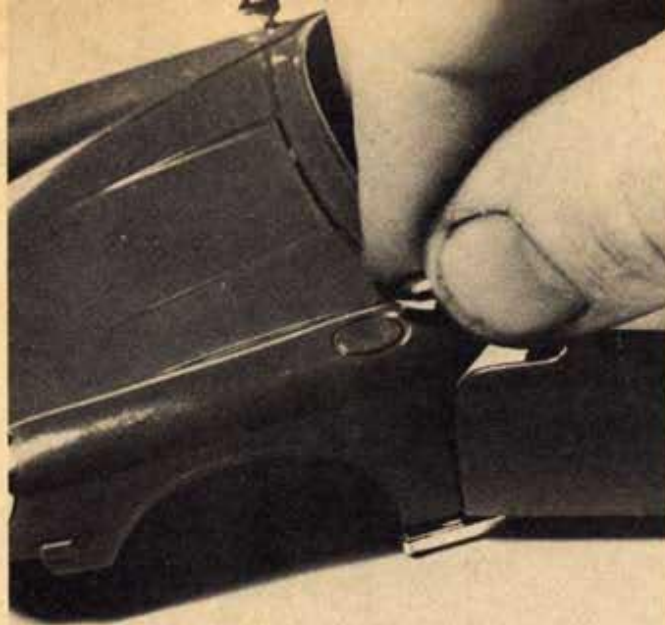
Spray the entire car with a coat of quality auto primer such as Magic's self-spray lacquer.



Sand the body with No. 600 grit sandpaper to expose any flaws in the plastic and to obtain a smooth finish. Repaint with primer and set aside.



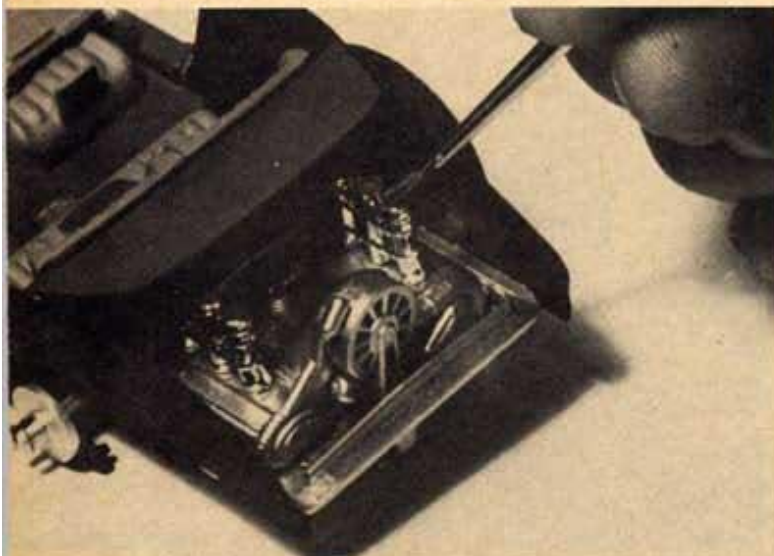
Spray the body with any suitable paint. You can speed up the drying time by setting the car in an oven that is 150° hot and with the rheostat off. Buff out the body with Aero Gloss Wax.



Drill out the holes to mount the mirrors and the rest of the chrome trim. Scrape the chrome off any areas to be glued.



Paint the floorboards with a dark flat brown to simulate carpeting. Paint the seats a flat, light tan to simulate leather.



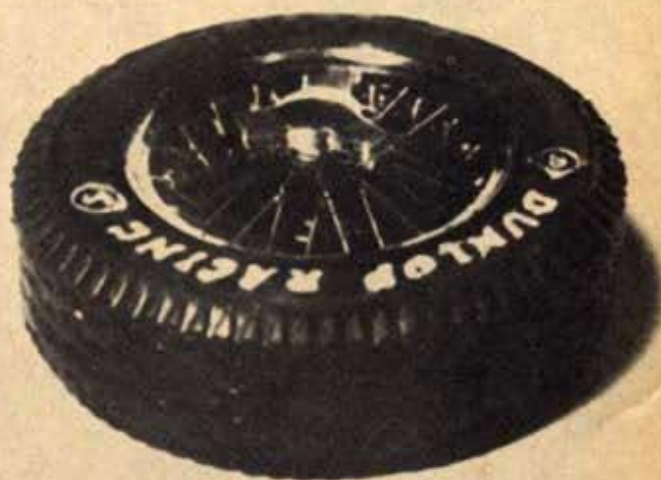
Leave off the air cleaners that come with the kit and hollow out the carburetor bells. Paint the openings flat black.



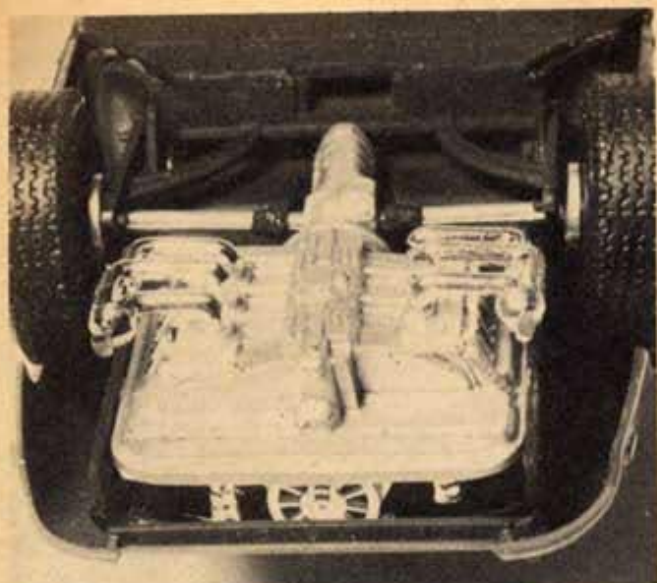
Nothing enhances the appearance of a tire or car more than raised, painted lettering. Use flat white paint and a No. 000 brush. Allow the paint to get tacky and drag the brush across the letters.



You'll have to grind away the outer portion of the drum if you intend to use different wheels and tires.



Wire wheels and some Dunlop or Continental tires can be found in older Revell kits. A sharp looking set-up would be the Empi wheels as found in the dune buggy.



The chrome exhaust headers were lifted from an old Corvair engine. Surprisingly enough, they are a "bolt-on" item here.



You can use the same technique on chrome trim that you used on the tires. The trick is to keep the paint tacky enough so that it won't flow into the letters.



The meat ball decals are leftover slot car items, but you can use the Auto World items just as well. Smooth out any wrinkles with a tissue that has been dampened slightly.

Now all that is needed to complete the car is a set of Quartz iodine driving lights from the dune buggy kit.



I use white glue such as Elmer's for the headlights because it will dry clear and won't frost the plastic.



Wild wings and super scoops may mark the super cars and funny cars of tomorrow.

IS THIS THE FUTURE FUNNY?

By Robert Schleicher

1971 CHALLENGER



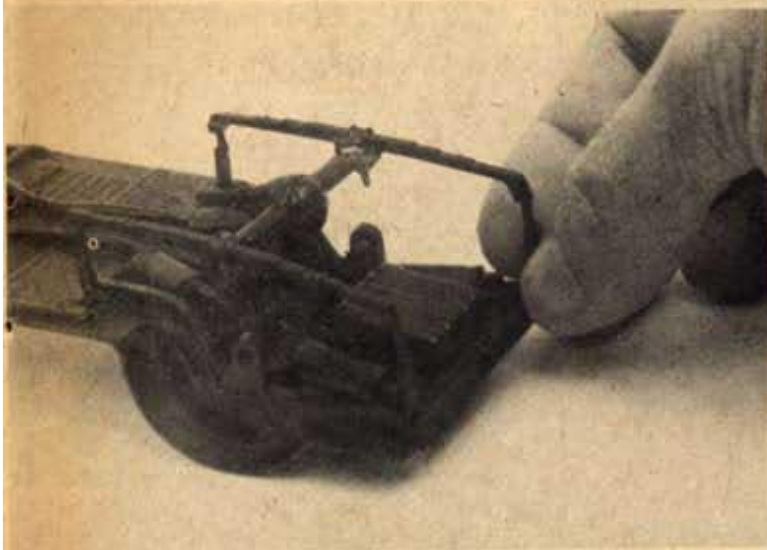
The future of the street "super" cars is questionable indeed. Both the Federal government and the insurance companies have focused their attention on the big-inch engines and high performance potential of cars like the various "Hemis," the GTO, Mach 1 and the like. The government wants to limit the smog that a multi-carbureted engine can produce and the insurance underwriters are doubling up on the rates for any "performance" car. The high performance cars of the seventies are, then, likely to look a whole lot faster than they really are — about all the automobile producers will be able to sell in any quantity will be those that merely look like they move out. Tomorrow's "Super" cars will look just like real racing cars and then some, but their performance will be strictly "street."

MPC's series of "Mild & Wild" 1971 car kits in 1/25 scale could well be an early-warning of what to expect from the real "super" and funny cars of the future. MPC has taken the typical rear spoiler wing and hood scoop and exaggerated them to the point where they virtually become the car's character. Other street racing details like hood locks that really look like locks and ultra-long rear spring shackles are also included in the kit's optional parts. For those who are satisfied with the stock appearance, MPC has included the proper pieces so the model can be assembled in showroom-stock condition. Wild name decals like the "Dodge" on the spoiler's supports and the "Challenger" down the side panels are also part of the MPC "Mild & Wild" 1/25 scale kits.

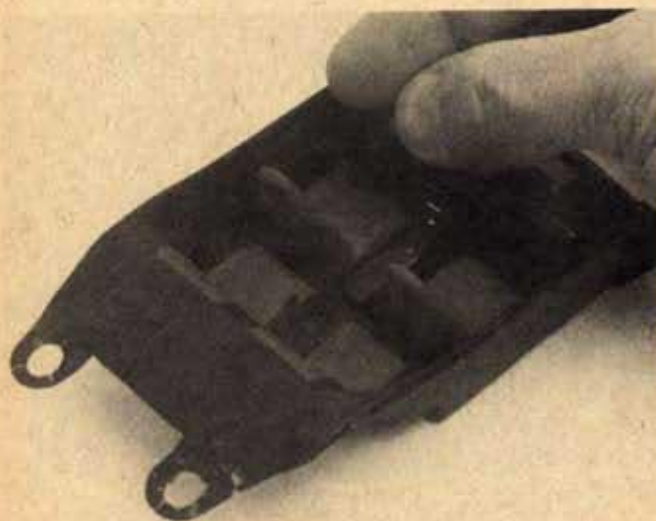
The "wild" parts, from the "Mild & Wild" kits transform the stock street version of the 1971 cars into what could easily be considered the pro stock-class drag racer of the future. Open exhaust headers, mag-style wheels, slicks, and those super-long rear spring shackles give the model a mean look. If the pro stockers are your bag, you'll be right on with these "wild" chassis and body bits.

We felt, however, that the mean appearance of the car cried out for a chassis and engine that was more racer than street car. With just a little modification, the chassis from almost any of the MPC funny cars (such as Landy's Dodge) will fit right under the "Mild & Wild" bodies. The wheelbase on the 1971 Challenger and the other kits in the MPC "Mild & Wild" series is an exact 1/25 scale duplicate of the real car's — about an inch shorter than the wheelbase of most of MPC's funny car chassis.

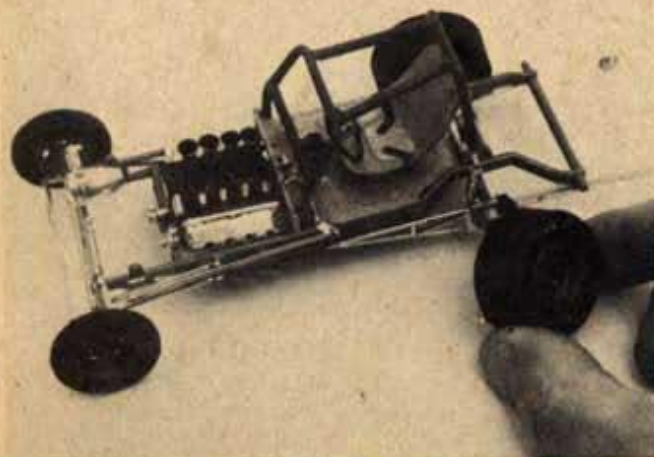
The simplest way to shorten the chassis is to slice out one of the triangular-braced boxes from the side rails. We did just this on our funny car chassis, removing an equal amount from the steering drag link, and assembling the balance of the chassis, engine, and funny car interior right from the kit. Somehow that lightweight rail chassis and the injected overhead cam Ford mill make the Challenger just that much meaner.



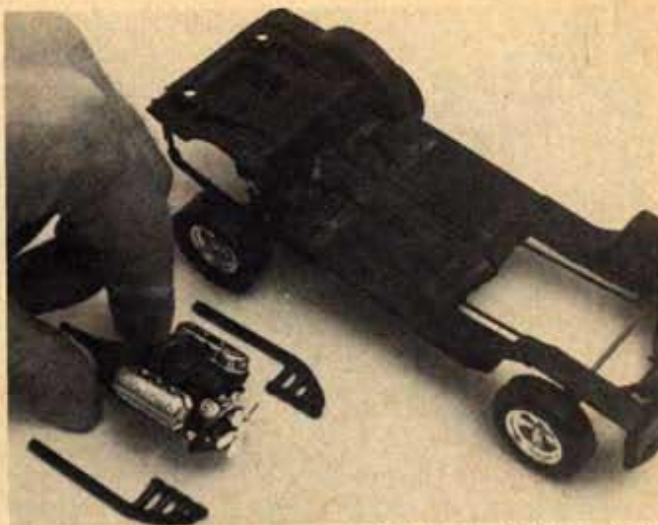
These ultra-long rear spring shackles are among the "wild" parts in the MPC "Mild & Wild" 1971 Dodge Challenger kit.



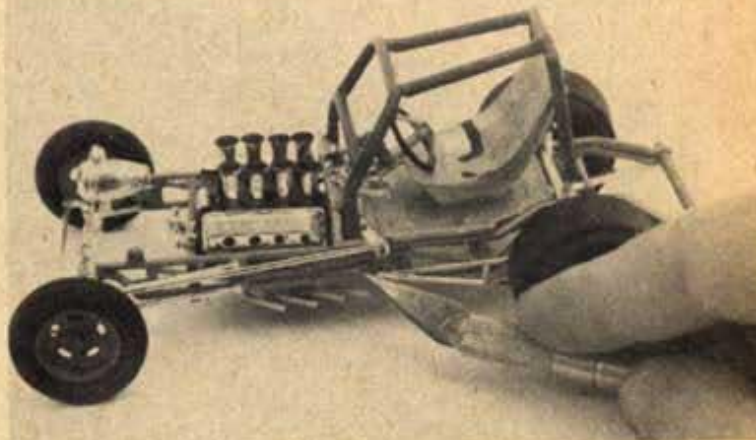
If you're building the "mild" street version or the mean "wild" Pro Stocker you'll want to complete the detailed interior furnished in the MPC 1/25 scale kit.



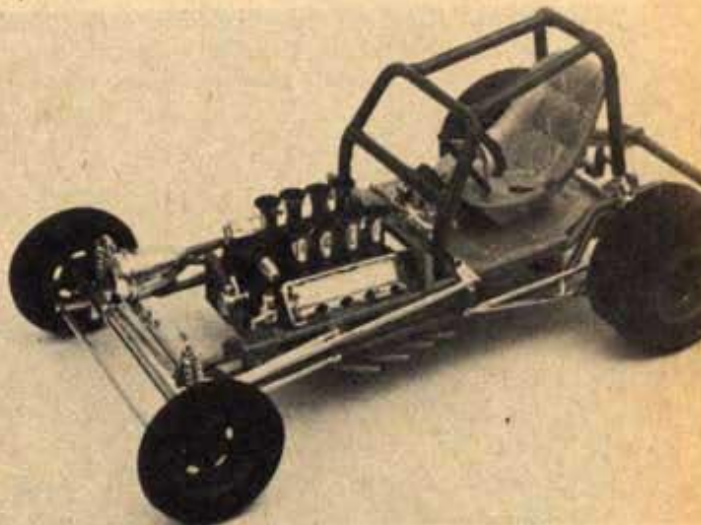
Super-wide slicks and mag-style wheels from the funny car kit are glued in place to give the finished model an exterior hint of the funny car chassis beneath that wild body.



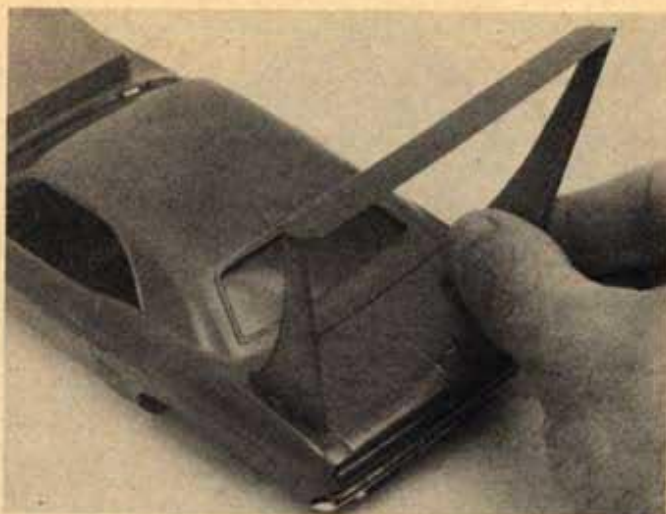
The engine in the 1971 Dodge Challenger includes all the details of the real thing. The headers are best glued in place after the engine. Correct Chrysler suspension is there too.



The complete chassis, engine and interior from the MPC "Landy's Dodge" or any of their other funny car racer kits can be substituted for the stock chassis. The funny car chassis side members must be shortened by one panel at the point shown.



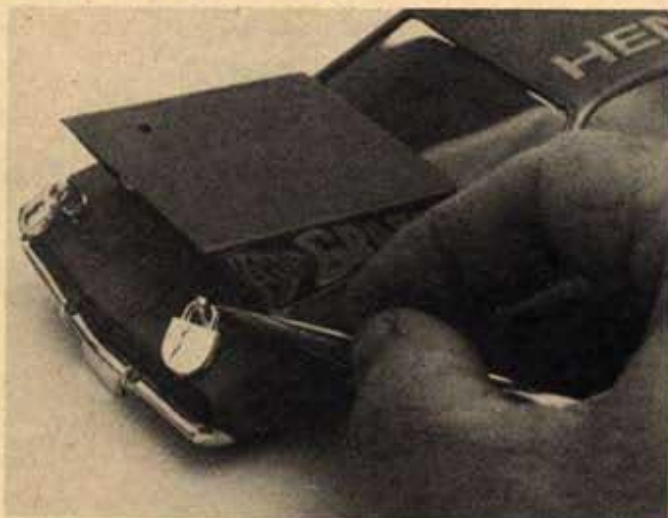
The MPC funny car interior is used in place of the stock interior furnished with the "Mild & Wild" kit series. The steering drag link must be shortened to match the new chassis.



The super high spoiler wing, from the "wild" parts options, is glued in place beside the trunk lid lines, the giant hood spoiler fitted, and the body painted in a suitable color.



The "Mild & Wild" series if 1971 car kits include funny car-type decals. Dip decal and paper in water and set aside on a blotter while glue soaks and dissolves, then apply as shown.



Sand the plating from the mounting surfaces of the hood lock mounts and glue them in place. Padlock hood locks are also part of the "wild" kit part options.

Substituting a full funny car chassis does little to alter the exterior appearance of the model but you know that there's a real racing chassis lurking beneath that scoop and spoiler.



The chassis from the stock kit, with the "wild" rear suspension and mag wheels, makes the MPC Dodge Challenger into a mean-looking street racer.



QUESTION- AIRE

With just a bit of your time, you can help us plan future issues of *Model Car Science* to better suit your modeling desires. Just fill out this questionnaire and mail to the address shown. We'll sift through the information carefully, and shape MCS to suit *your* needs. Fair enough?

My favorite category

(You may check as many as you wish)

- ☐ Slot racing
- ☐ Classic cars
- ☐ Model trains
- ☒ Die-cast miniature cars
("MATCHBOX" and similar)
- ☐ R/C gas-powered auto racing
- ☐ Military vehicles
- ☐ Model rockets
- ☐ Model airplanes
- ☐ Model motorcycles
- ☐ Detailing features
- ☐ Customizing features
- ☐ Painting articles

My favorite writer in this category

My favorite MCS features are, in order:

(List as many as you wish, such as 1. New Products, 2. Model Mail, 3. Model of the Month, etc.)

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

Thank you! Your cooperation is appreciated!

Send to:

Model Car Science, C/O Raymond Hoy, Editor,
P.O. Box 1821, Thousand Oaks, California 91360.

Name ----- Age -----

Address -----

City ----- State ----- Zip -----

Win a one-year subscription to MCS. All you have to do is send a clear black and white photo (no color, please) of your 1/32 or 1/24 home track to the following address: Home Track, P.O. Box 1821, Thousand Oaks, Calif. 91360. If your track is selected, you'll see it in MCS, and win the one-year sub, too. Include a bit of information about your track, so others can gain from your experience.

HOME LAYOUT OF THE MONTH

Occasionally we hear from foreign miniature auto racers, and are always delighted. This month we received a letter and a few photos from Mr. David Lightwood, of Marlborough, New Zealand. Dave writes: "We wish to enter one of our club tracks in your 'Home Layout of the Month' contest. We do not know if this is possible, as we are an overseas country.

"Our club consists of 12 seniors and eight juniors. We meet twice a week. Cars raced are mainly anglewinders. Many bodies, tyres, gears, etc., come from England.

"The club has two tracks, and race nights are alternated between them. Race night is Monday and practice night is Thursday.

"The larger of the two tracks is built on a 16' x 8' x 1/2" piece of chipboard. It took about two months to build, including scenery, which is carved out of foam plastic. The four lanes are colour coded red, green, white and blue. It is 78 feet per lap.

"A good lap time would be six seconds. Power is supplied from 12 volt car batteries. Phone plugs are used on controllers. Main straight is 13 feet long. The home-made lap counters count up to 9,999 laps, and are electronically operated.

"An eight-hour race is held on this track every year, and in this time, teams clocked up about 3,400 laps.

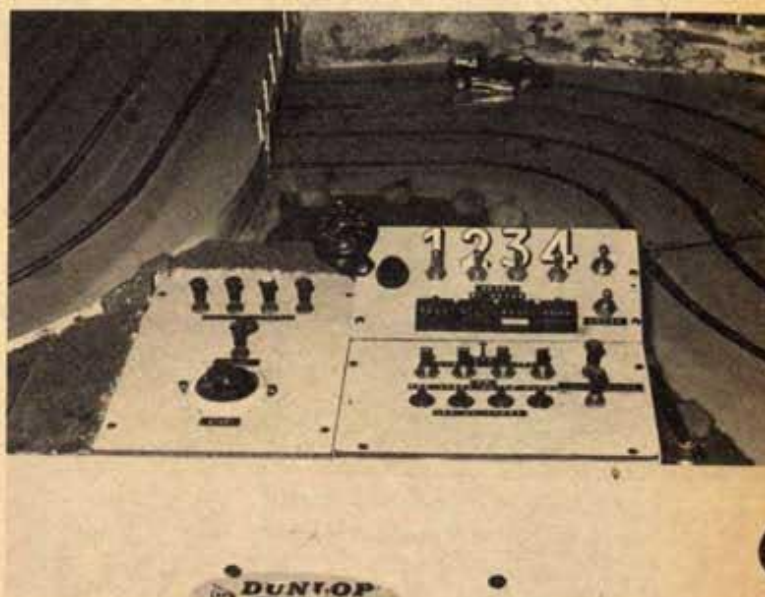
"We only race 1/32 cars. The old vintage cars do go! The other two cars with them are Formula One Sigmas, and since they haven't been raced in real life, aren't able to be raced in trophy races. We try to keep a tidy track and real looking cars.

"Our club competes with other clubs and we have won all the eight-hour races, and have won the 12 hour race held in Christchurch, but lost it earlier in the year.

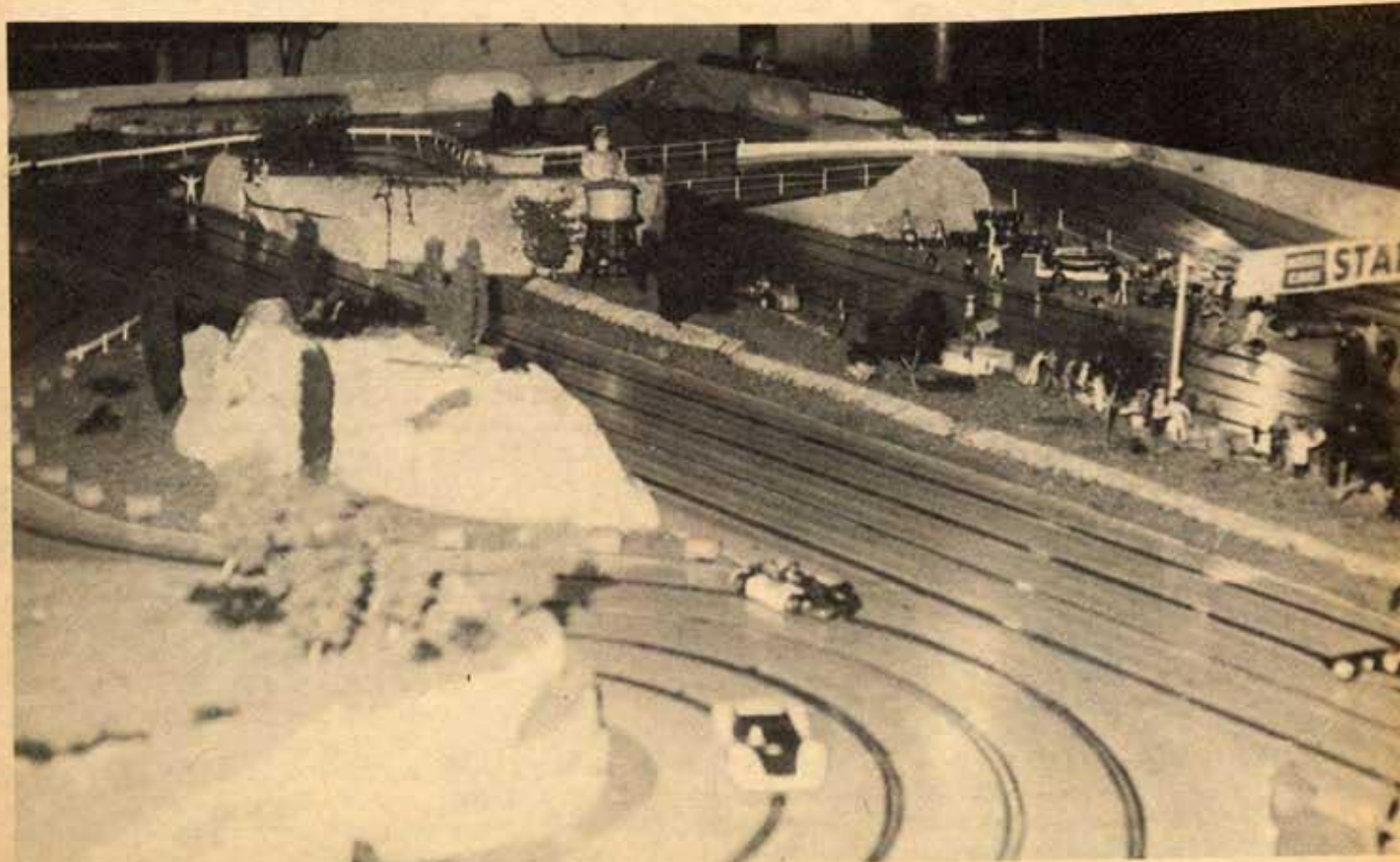
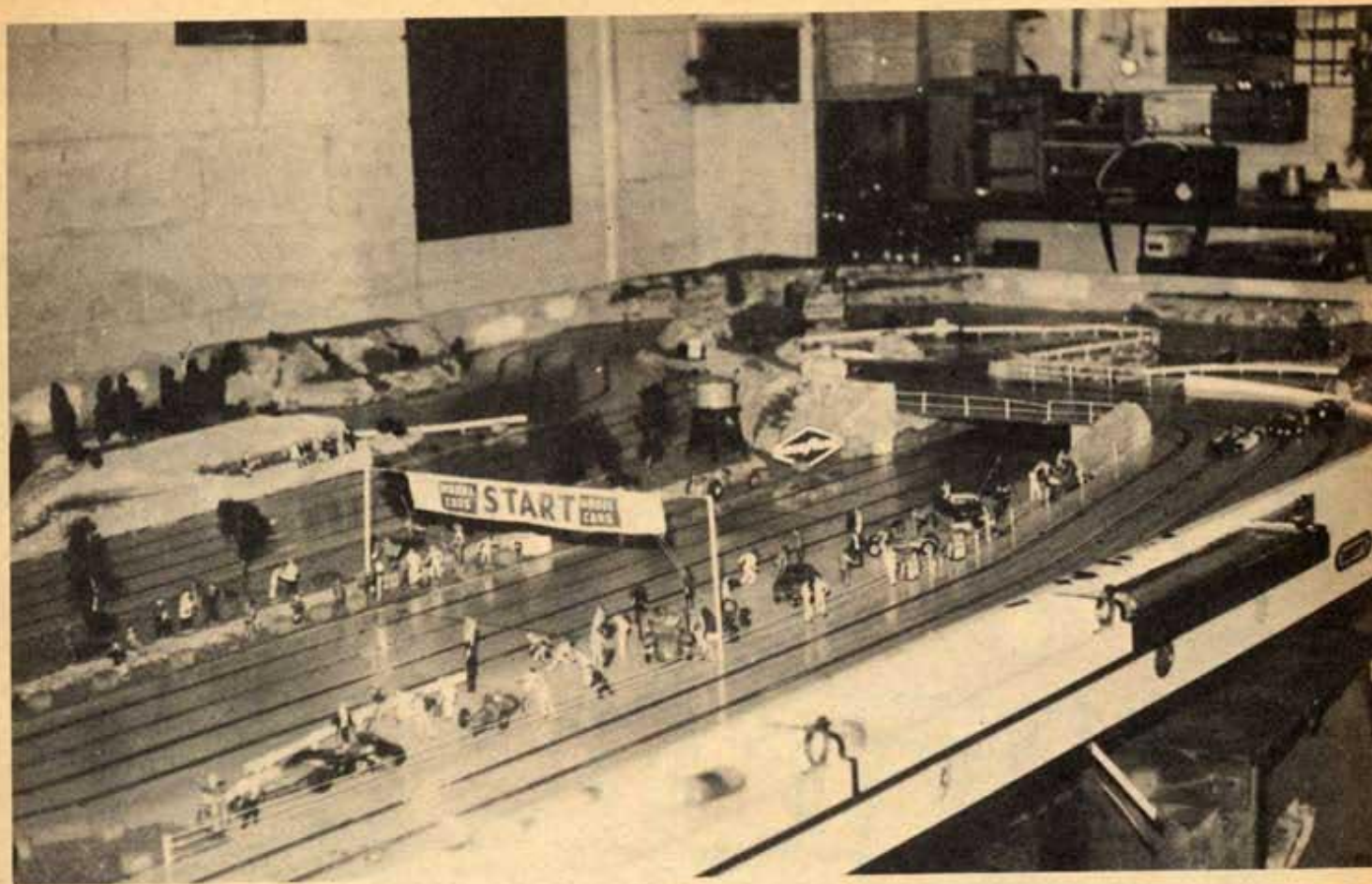
"Keep up the good work. We are about six-seven months behind out here, so we won't know what's happened until about April 1971. If we don't win this competition, could you please put a note in your mag, letting other foreign clubs know that it is possible for them to enter this competition."

Well, Dave, you've won. It's a fantastic track, and we're happy indeed to put your photos and description in MCS. This should also answer any questions raised by your fellow countrymen or other foreign miniature auto racers. This is open competition to any individual or club in the world.

We're placing your club's one-year subscription to *Model Car Science* in your name. The first copy will be shipped to you shortly. Congratulations.



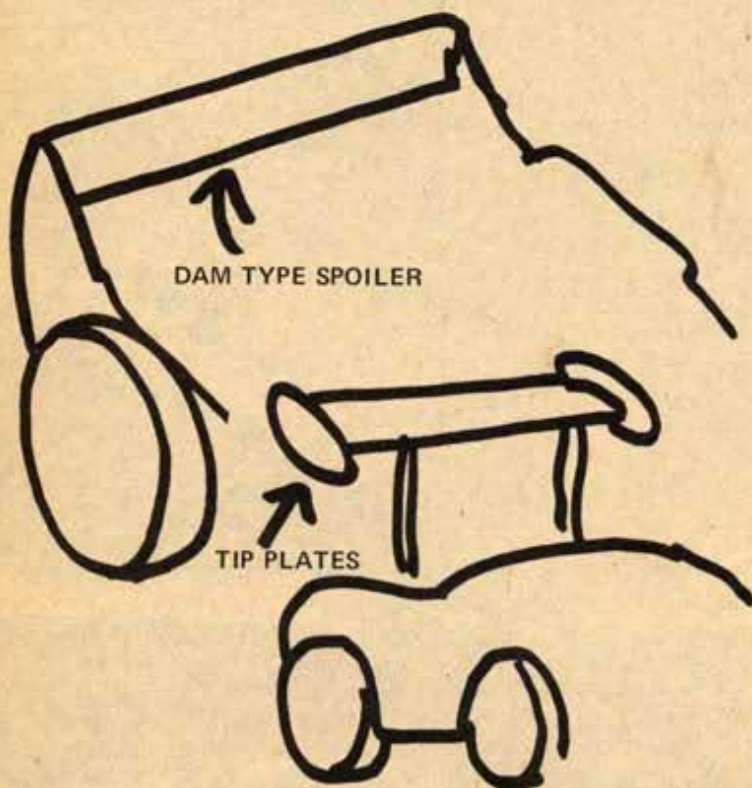
The electronic lap counters count up to 9,999 laps. Power is supplied by 12 volt car batteries.



Four lanes and 78' per lap worth of fun, this beautiful club track took about two months to build.

Spoilers, diaphanes and wings —
are they really necessary?

WINGS 'n THINGS



The efficiency of wings or spoilers can be improved by adding side plates. These plates prevent the air from "spilling" off the sides of the wing or spoiler.

Look around you. You're surrounded by air (if you're not, you're in trouble!). Don't look at the air in front of you as just so much smog. Instead, think of it as a huge collection of molecules of gas (sort of like billions of micro-mini ping-pong balls).

When a car moves through the air, it pushes these little ping-pong balls out of the way — often in a violent manner causing turbulence (swirling little pockets of air) all around the body. Without getting into the aerodynamics of it, take my word for it that if the molecules are pushed aside one way, you get lift, and if they're pushed aside another way, you get no effect or even downward force. Life being what it is, you usually get lift.

There are two ways to combat lift. One is to create a downward force that will lessen or eliminate the body lift, and another is to "spoil" or break up the lifting force so it doesn't affect the car.

One of the best ways to create downward force is the

fabled, fabulous, secret weapon — *THE WING!* Texan Jim Hall introduced the wing to the modern race car a few years ago. Airplane-like wings were used on a rocket powered Opel during the twenties or thirties, but when Hall introduced the wing in the sixties, he added an innovation by putting the wing on stilts.

Putting the wing up on stilts made it more efficient because it got it up out of the turbulence caused by the body pushing its way through the air. It also allowed Hall to mount the stilts directly on the rear hubs to make the air "press" the rear tires against the road. Within a few years wings were generally adopted by many types of race cars. Jack Brabham even built a Formula-1 biplane with a wing on the front to keep the front end down.

High, stilt-mounted wings are now banned from full-size cars as "unsafe" (a debatable point in a sport that is inherently "unsafe"). Only low mounted wings are allowed. But both high and low mounted wings can still be used on slot cars.

There are structural and practical considerations to think about with slot car wings. Structurally, you have to be sure the body will take aerodynamic loads. Bruce McLaren's tragic fatal accident was caused by aerodynamic force working loose the bodywork of the car he was testing. When .010 sheet slot bodies were first introduced, the force of spoilers caused the lightweight bodies to flex and foul up the rear tires because racers weren't used to working with the light bodies.

Practically, the most important consideration is, will spoilers and wings actually help a car? The answer is generally yes, but read on until we start talking about scale effect before you start tacking things all over your cars.

The second way to combat body lift is to "spoil" the lifting effect in some way. The most common way to do this is to use a device cleverly called a "spoiler." No, it's not a brand of razor blade, but an aerodynamic device. You've seen them on all sorts of cars for street and competition, and they've become quite a styling fad. It's simply a bent-up portion of the bodywork at the rear of the car.

I don't know when spoilers were first introduced to full sized cars. Ferrari had one many years ago on a Le Mans car that got the nickname "The Ginther Lip," after driver Ritchie Ginther. I'm sure there were spoiler applications before this (but probably none with so colorful a name).

A spoiler works by breaking up the lifting forces to cut down or kill lift and, sometimes, create downward force.

If the body is designed right in the first place, you don't need much, if any, spoiler to kill lift. The trend in slot cars (and some full size cars) is to go to comparatively large spoilers. There are slot car rules governing how big your spoiler can be, and fellows usually go as big as these rules allow. But one thing to keep in mind is that with every aerodynamic device you get drag as well as benefits.

What's drag? That's the thing that says it's better to make a car shaped like a teardrop than the side of a barn. A common name for drag is wind resistance. As a car pushes molecules of air aside as it moves, it uses up energy. The harder it has to push to move these molecules of air aside (or the more molecules you push), the more energy it uses. Drag is the thing that usually limits the top speed of most high performance cars — the car has the potential for more speed, but the drag it generates just won't let it go faster.

With spoilers, wings or any aerodynamic device, you can reach the point where the drag generated by the device

By Dale Flanagan

more than eliminates any good effects you may be getting. In other words, the car isn't lifting, but the top speed is now so low (because of drag) that it doesn't matter any more. Because of this, the idea is to experiment until you're at the point where the extra drag is worth the benefits you get.

In Formula-1 racing, for instance, teams experiment until the wing on the car is adjusted to give them the best stability and fastest lap time possible. They accept a little slower speed down the straight (because of the drag of the wing) for faster lap times and more stability. Not a bad trade. The idea in slot cars is to experiment to get the same effect. Unfortunately, most fellows don't bother to do this. They just tack on the biggest available spoiler without even experimenting to see how much (if any) spoiler they really need, and suffer the penalty of high drag for their lack of care.

You can adjust wings and spoilers in a variety of ways. With wings, you can try different sizes, shapes, heights and angles, if you really want to get involved. Most likely, just fooling around with the angle of the wing would be your best bet. By the way, this angle is called the "angle of incidence" (you don't have to memorize this, I'm not pulling a surprise quiz at the end of this article) and the front edge of the wing must be lower to the track than the rear edge, otherwise your wing will generate lift.

Generally, the greater the angle of the wing on a car, the more downward force it will develop. But you'll soon reach an angle where the drag goes way up all of a sudden, and your wing becomes a big air brake instead. Wings are weird like that. The exact angle depends on the wing shape and car speed, so you'll just have to keep this point in mind as you experiment. I can't tell you any set rule about when the drag goes up.

If you want to make the wing more efficient (which will mean you can use a smaller wing or less angle for less drag), you can add tip plates to the wing. Tip plates stop the air from "spilling" off the edge of the wing, and this improves the way the wing works.

This same general principle is used with spoilers in the shape of the "dam type" spoiler. This type of spoiler is in wide use on slot cars and has plates that run forward from the spoiler along the side of the car to prevent the air from spilling off the side of the car and away from the spoiler. On some cars (Autocoast Ti-22) the whole body acts like side plates to make the rear spoiler more efficient.

While we're on the subject of tack-on goodies, trim tabs and diplanes can be used effectively to aid stability. A diplane is just a barrier that runs from the nose of the car right down next to the track surface. It prevents air from getting under the body to cause front end lifting. They also work as super "car-catchers" to scoop spun-out cars out of your way! By the way, proper venting of the body can also prove effective for cutting lift and bleeding off high pressure air from inside the body. Vents in the front fenders, above the rear tires, and in the back of the body relieve built-up pressure. If you really want to get fancy, you can play Jim Hall and suck the air out from inside the body to create a negative pressure area, as used in the new Chaparral 2J. I doubt if all the complicated plumbing you would need for a 1/24 Chaparral 2J would be worth the effort, but it sure would shake up the competition!

Unless you're willing to fool with them, forget about trim tabs. They have to be placed and adjusted properly for

them to do much good.

On 1/24 scale cars, spoilers, wings and diplanes work; there's no question about that. But that doesn't necessarily mean that they'll work on smaller scales. The monkey wrench in the works here is something called "scale effect."

Aerodynamic devices work because of the molecules of air striking them (remember the ping-pong balls mentioned earlier?). How these devices work, if at all, depends on the number of these molecules striking the device at any given time, and this number depends on the size, shape and speed of the device.

When you reduce something in size, you reduce its area drastically. Reduce something by 1/2 and you cut down its area by 3/4. It gets even worse if you're reducing a car to 1/24, 1/32 or 1/87 (HO) scale. This means that as you go down in scale, the area you have available for molecules to hit becomes less and less. Coupled with this, the actual speed of a model becomes less and less. And it's the actual speed, plus the shape and area, which decides how many molecules hit the aerodynamic device.

On a 1/24 car, which can carry up to three square inches of wing area (not to mention spoilers and diplanes), and which can hit 45 mph down a smooth straight, you have enough area and speed to make all sorts of aerodynamic goodies work. On a 1/32 scale car, you're sometimes starting to approach marginal conditions for area and speed (on the usually smaller 1/32 scale tracks). And when you get to HO, well... unless you have a grossly out of scale spoiler or wing, you can't carry much area on an HO car. And most home HO tracks are so short and twisty that you don't work up enough speed to really make spoilers effective. Wings and spoilers look fine for cosmetic purposes, but under most HO racing conditions, they probably aren't too effective. This doesn't mean that conditions can't change, however.

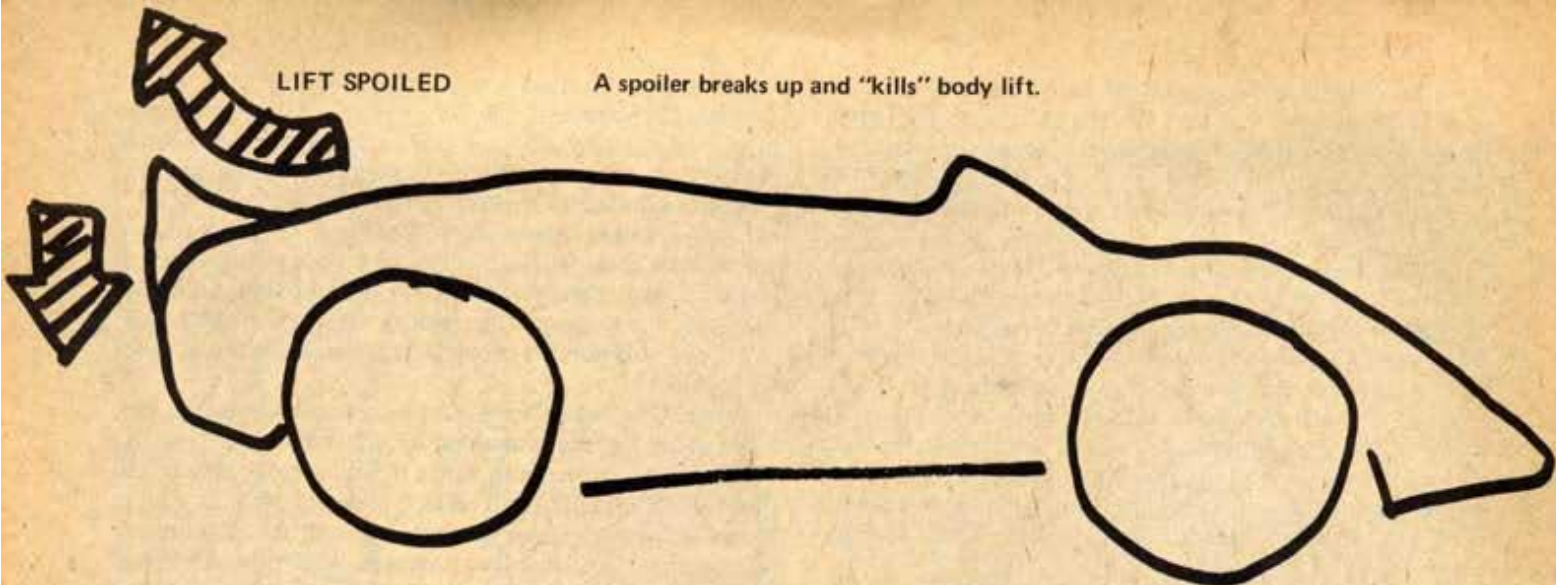
HO cars are a world of their own. If you want to read a publication which really covers them thoroughly (and does equal justice to 1/32 and 1/24 racing), I'd suggest that you subscribe to *Miniature Auto Racing*, a monthly newspaper devoted to slot racing. It's available from Pacific Publishing Group, P.O. Box 1821, Thousand Oaks, Calif. 91360. The subscription rates are three months for \$1.00; \$2.00 for six months; and \$4.00 for twelve months. Foreign subscriptions are sold only by the year, at \$5.00. No airmail postage is offered, due to the heavy weight of this large newspaper. I recommend it. (Yes, I write for it, but that's not why!)

HO cars are getting faster all the time, and the emergence of large commercial and club tracks means that speeds can only go up. As the actual speed of the cars increases, the small aerodynamic devices on HO cars will become more effective, and using wings, spoilers, diplanes, and such on HO cars could prove advantageous on fast cars moving on big tracks.

The essence of using any aerodynamic device in any scale is experimentation. Even on full scale cars, where often quite sophisticated computer techniques and qualified aerodynamicists are employed, you really don't know exactly what's going to happen, aerodynamic-wise, until you try the car. The profusion of tack-on tabs and spoilers to many full sized cars shows this. If the big boys experiment, it might be worth your while to do the same. Hopefully, after reading this article, you'll have some idea about what you're doing as you cut, trim and adjust your latest car's body.

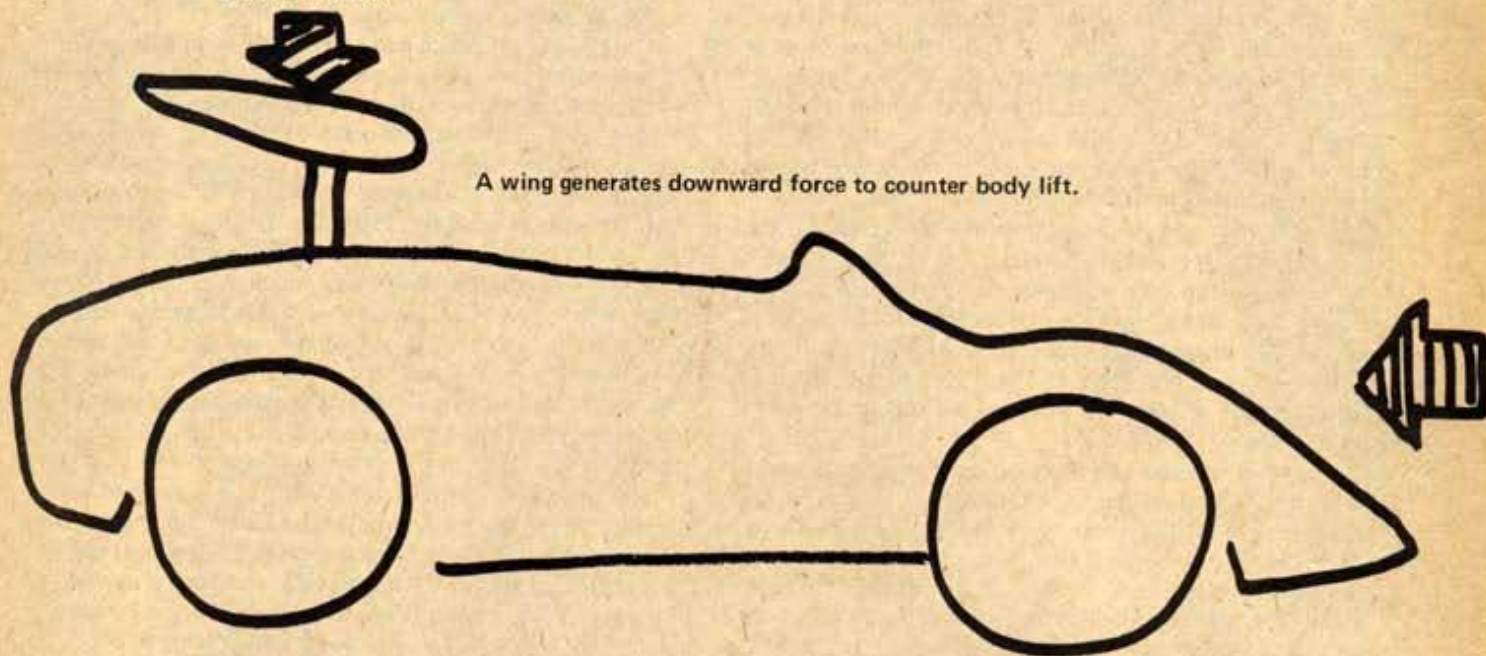
LIFT SPOILED

A spoiler breaks up and "kills" body lift.



DOWN FORCE

A wing generates downward force to counter body lift.



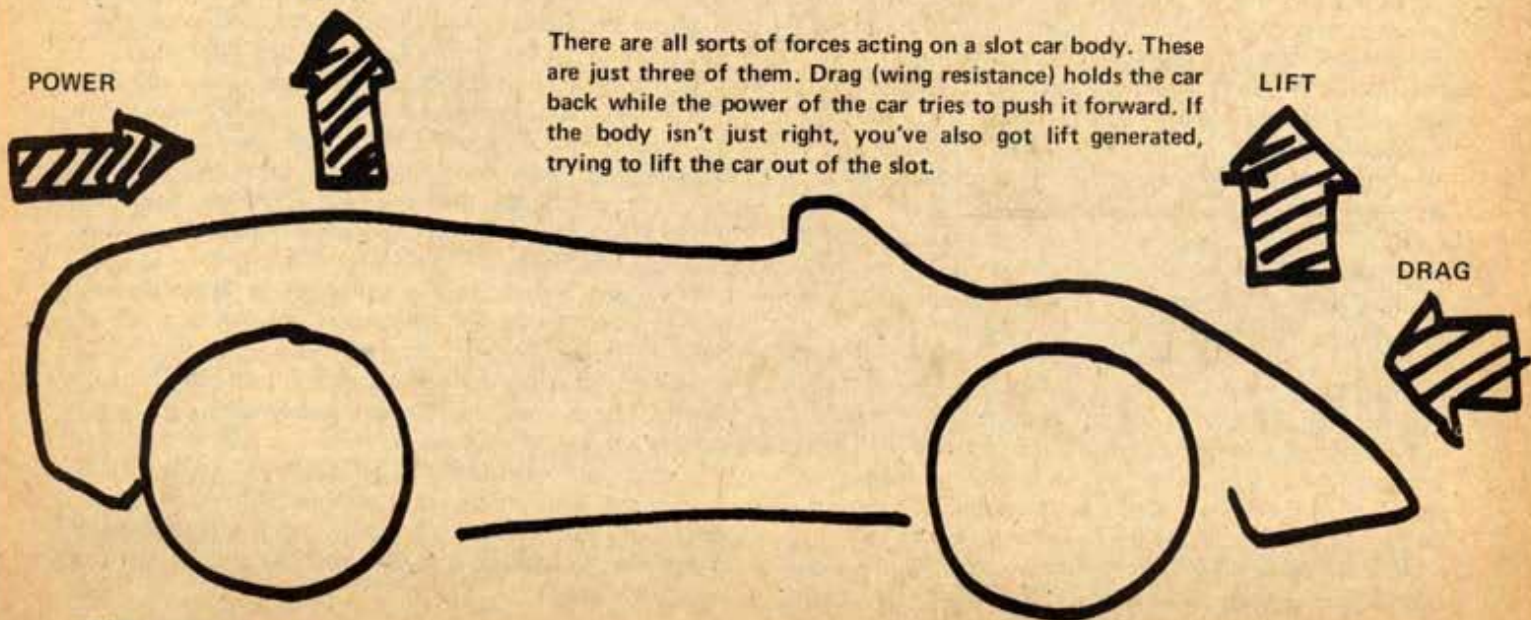
LIFT

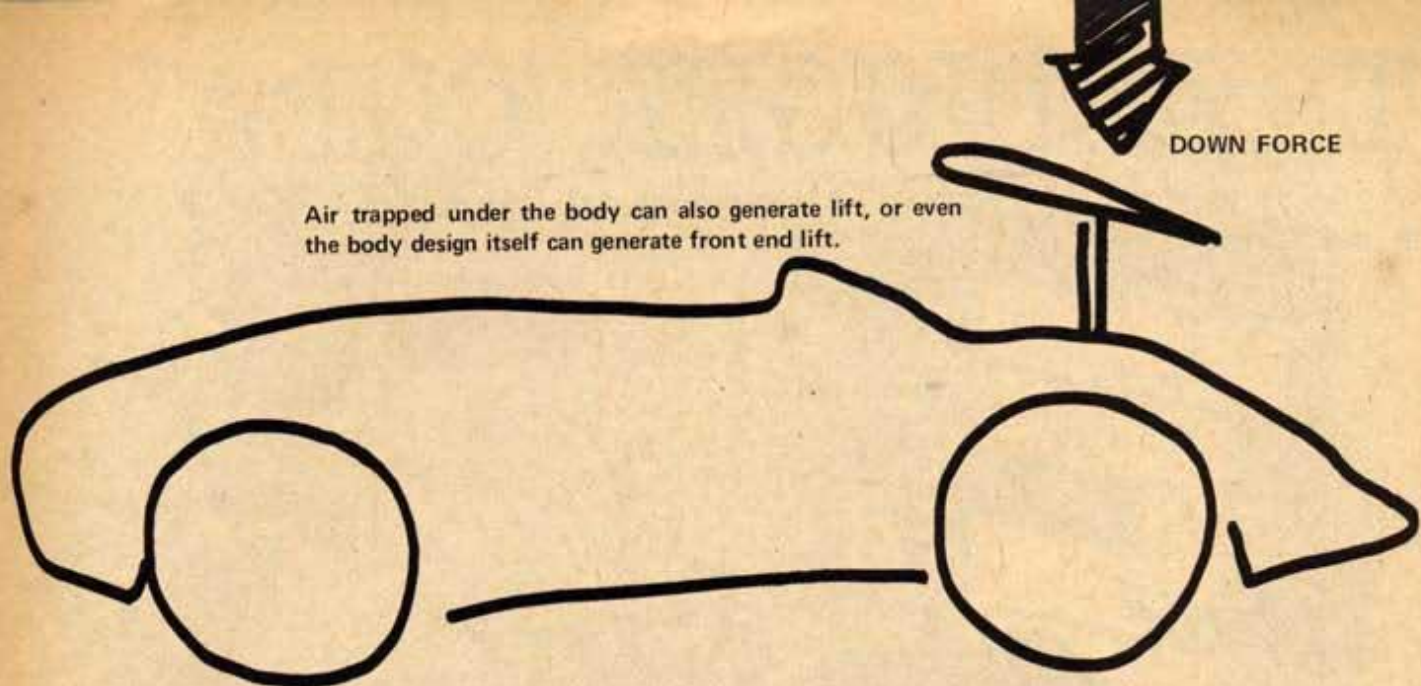
There are all sorts of forces acting on a slot car body. These are just three of them. Drag (wing resistance) holds the car back while the power of the car tries to push it forward. If the body isn't just right, you've also got lift generated, trying to lift the car out of the slot.

POWER

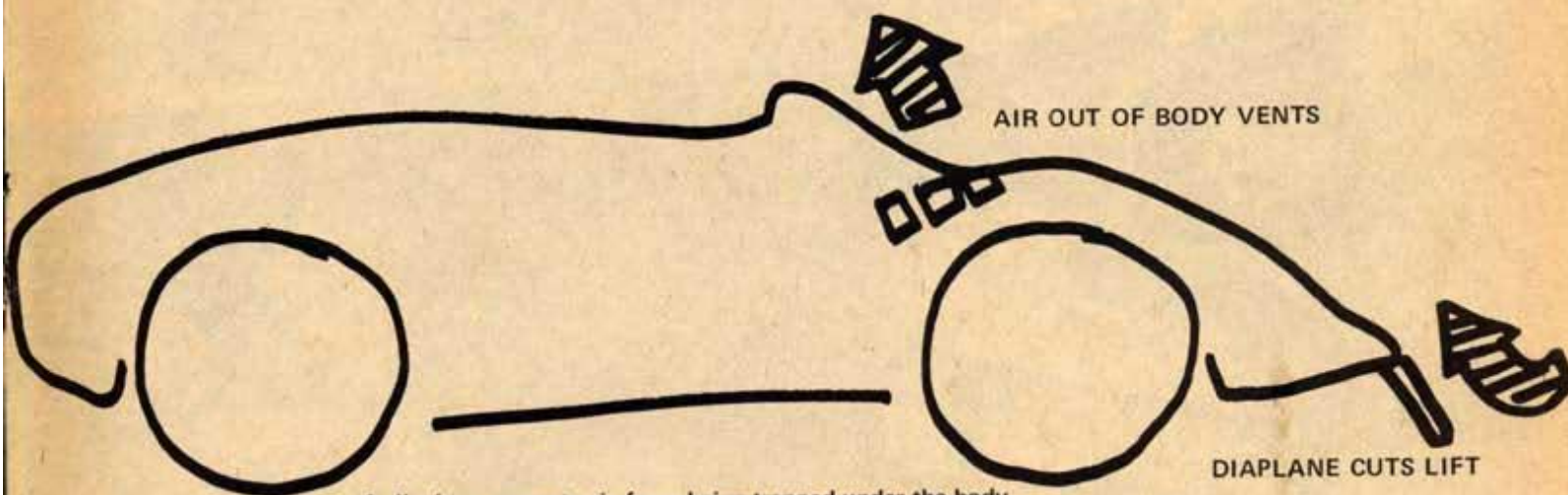
LIFT

DRAG

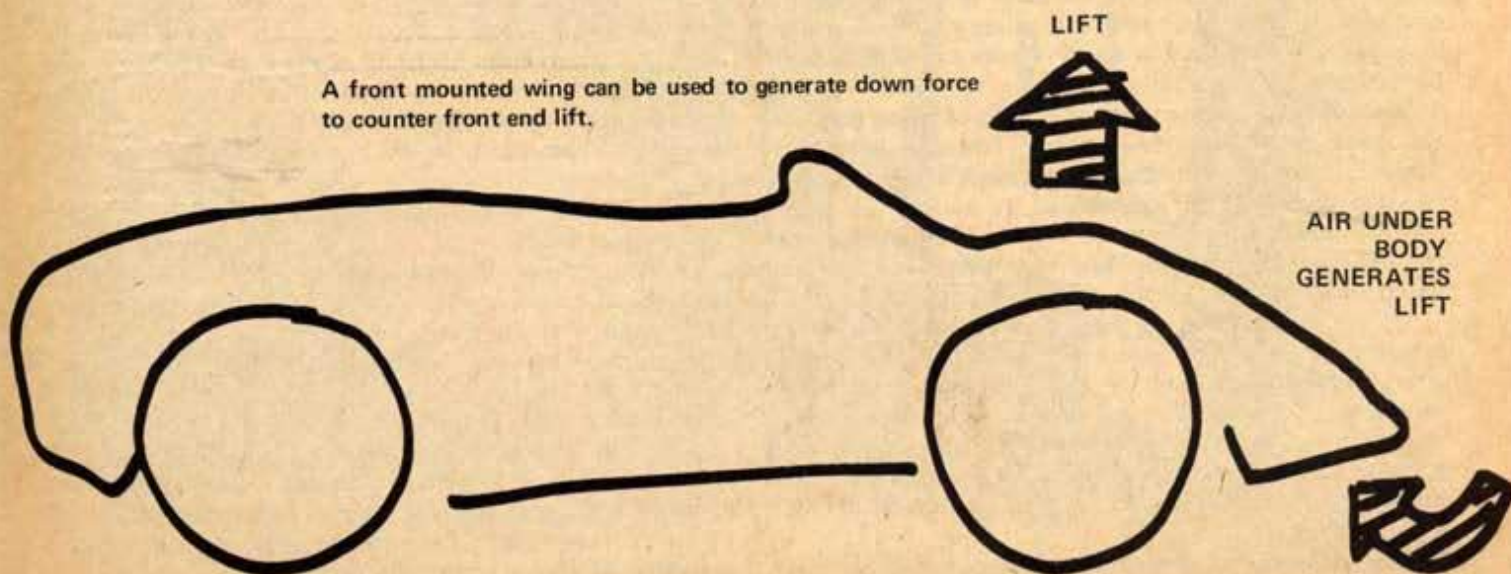




Air trapped under the body can also generate lift, or even the body design itself can generate front end lift.



A diplane prevents air from being trapped under the body to generate lift. Proper venting can also bleed off trapped air.

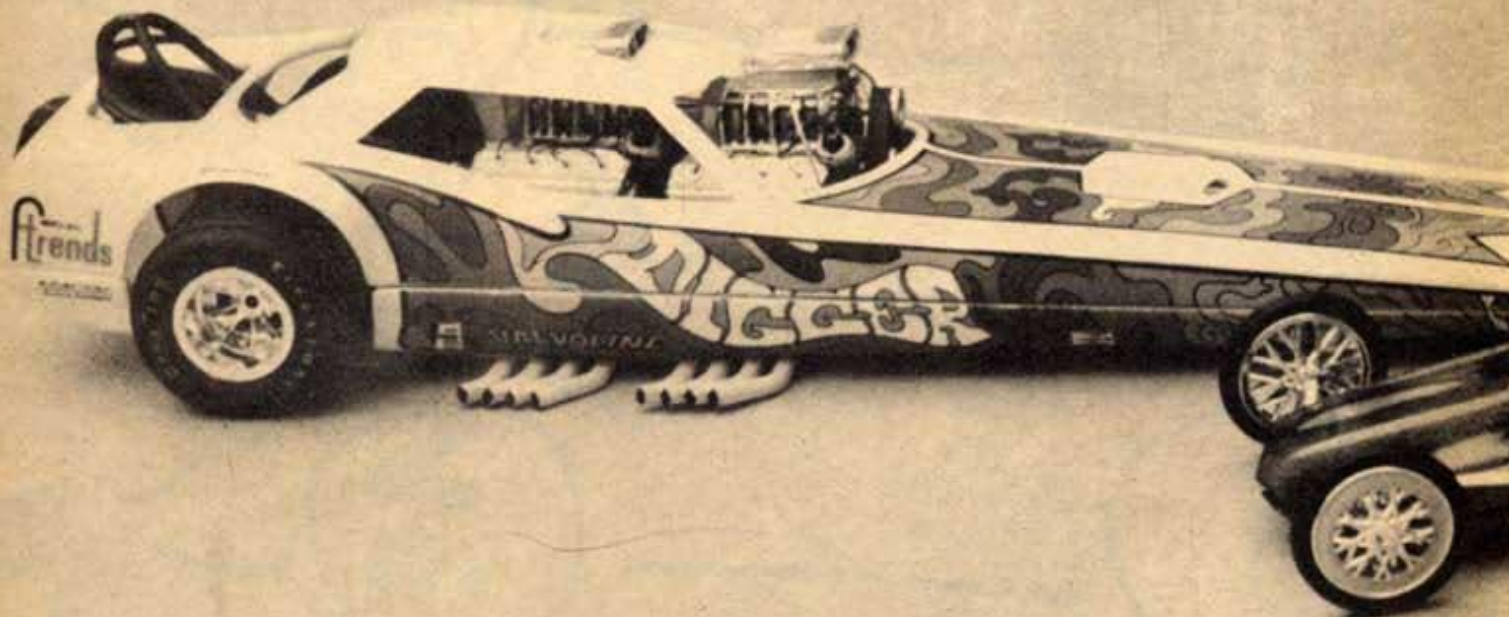


A front mounted wing can be used to generate down force to counter front end lift.

THE "DIGGER 'CUDA"

Here's a wild half-dragster, half-funny car screamer that will really get your heart started!

By Don Emmons



AMT's "Digger 'Cuda" is an interesting cross between a fuel dragster and a wild fuel burning funny car. In the coming years it would not be at all surprising to find that drag cars of this very style are the order of the day. Many of today's drivers have two cars running the circuit; a dragster and a funny car. A blend of both cars could likely be the funny car of the future.

While the twin-engine machine is not a common sight at the drags, there are a few around. Probably the most successful twin-engined dragster running is the popular "Freight Train." It has campaigned for many years. The "A&W Special" Chevy funny car of Dean Dillingham's is a conventional funny car sporting a twin Chevy setup. So you see, our twin-engined model is not too far-fetched.

We are showing two versions of the Digger kit. One is basically out-of-the-box with a detailed chassis and a wild airbrush paint job. Don't be afraid to experiment with various painting effects on your models. A model can take on an entirely different look by simply adding an original paint job. A way-out paint job is by far the most effective way to add to a model, and on a funny car of this type, anything goes.

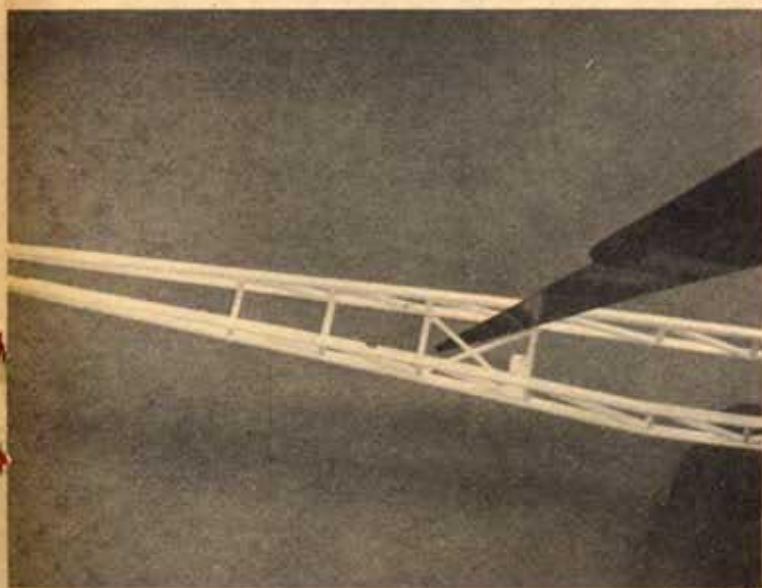
The twin-engined dragster required a second kit and

some parts from another kit. Parts swapping between kits is a good habit to get into unless you like your models to look like the kit version.

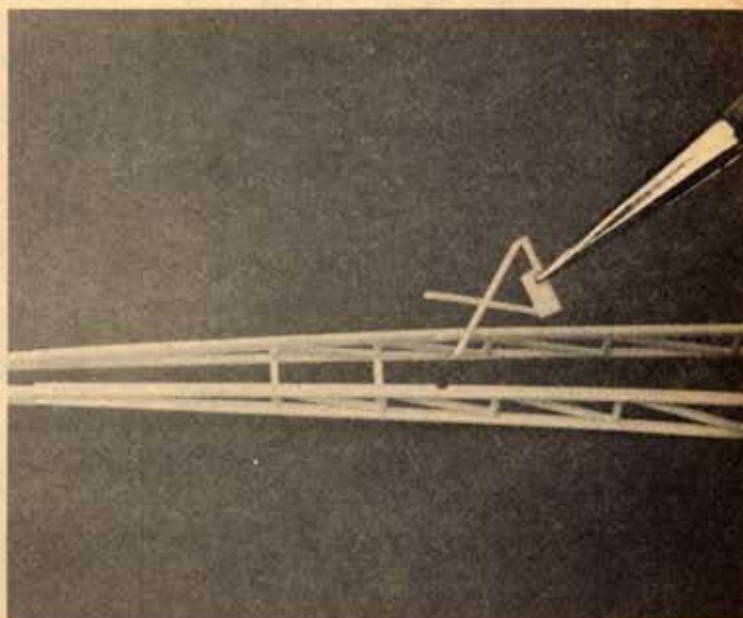
Valve covers and rear wheels on the twin-engined car are from the AMT Gremlin Funny Car kit. The Firestone wrinkle slicks are from AMT's '71 Sierra Grande pickup kit. Many parts could have been taken from a number of other kits to further change the appearance. Twin Ford engines could have been used, or use the American Mag wheels from the Gremlin kit on the Digger's big vinyl slicks. There's no limit to the various combinations possible. Use your imagination.

Surprisingly enough, the alterations that need to be made to order to mount the second engine in this model are very simple. But the finished product looks as if it were intended to be that way. The most modification takes place on the frame rails, and it's really not difficult at all. The cross bracing must be moved forward in the chassis. This spreads the frame rails to give enough room to fit the engine into the tapering chassis. Another important step is to make certain the engines are aligned with each other.

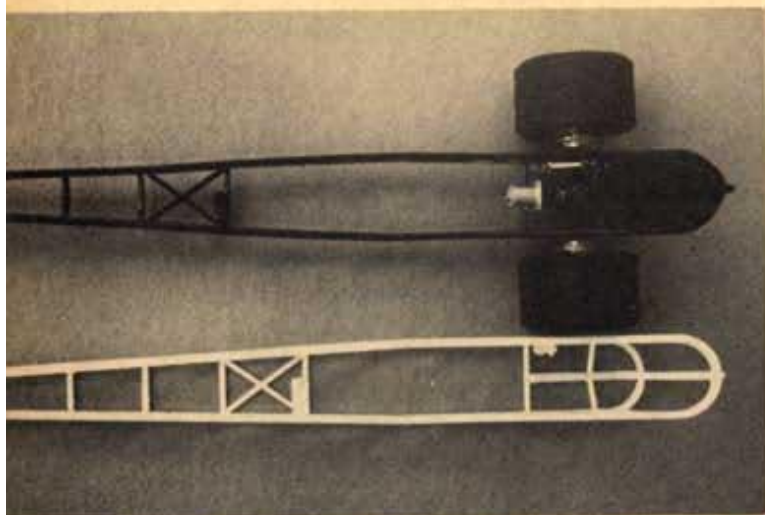
Either model, single or double engine, will be a rewarding addition to your collection.



Installing a second engine in the chassis necessitates the removal of two rear crossmembers. Saw them off close to sides.



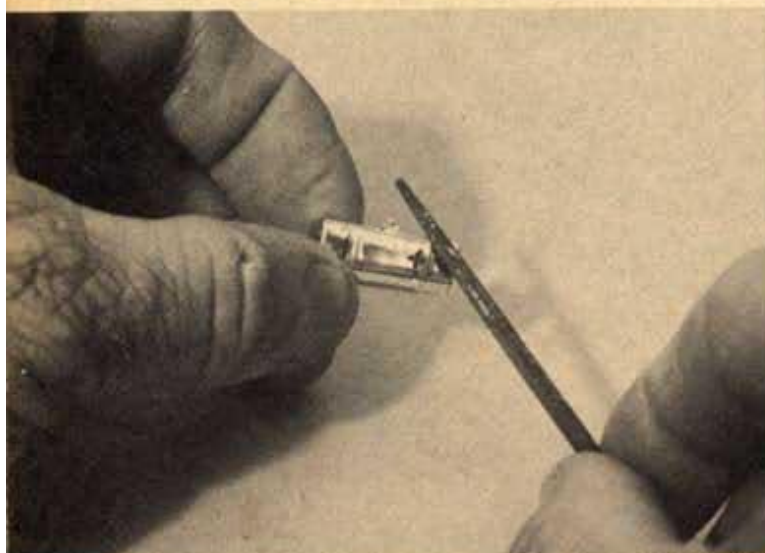
Cut front cross brace piece away and slide it ahead on the chassis so it fits up against cross brace.



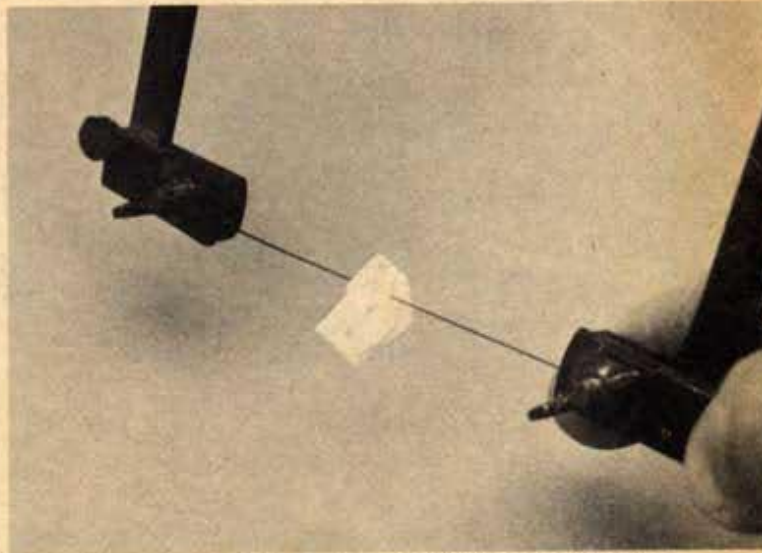
Engine can be installed in painted chassis. Sliding cross bracing forward spreads side rails enough to allow second engine to fit between frame rails.



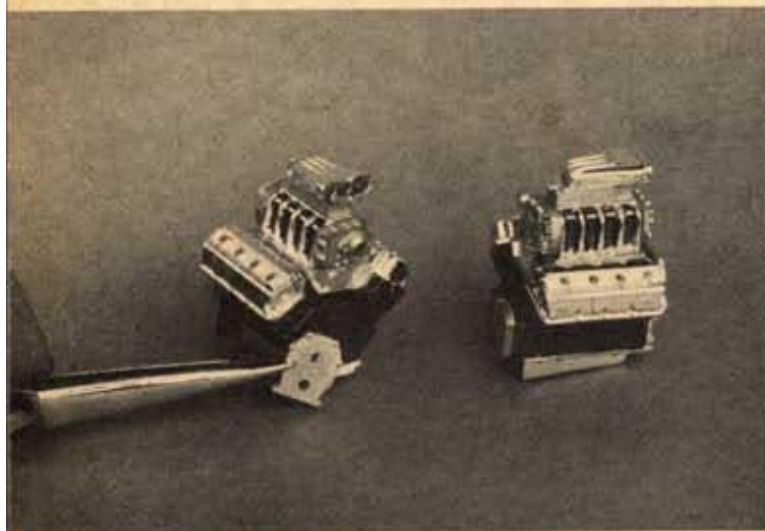
Seat is sprayed flat black. Back side should be painted flat aluminum color to resemble real aluminum bucket seat.



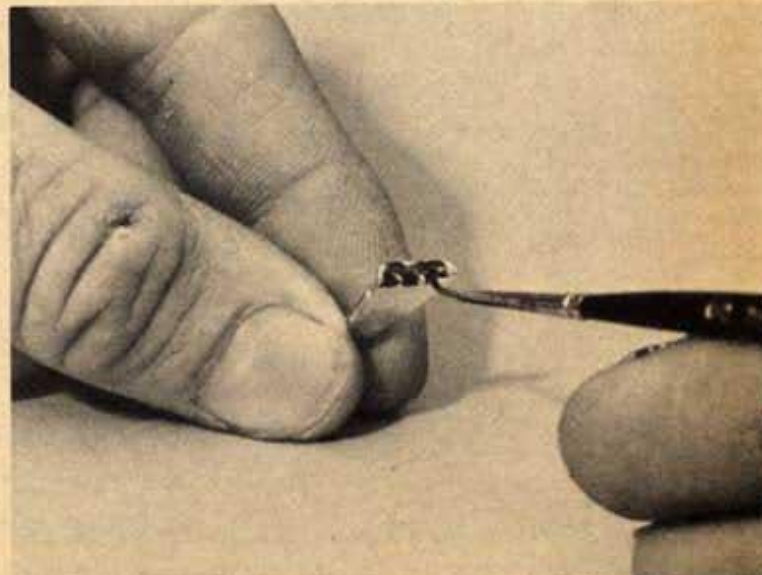
Fuel tank is moved forward in chassis. Top edge of sides must be filed down slightly. Leave bracket on top as is.



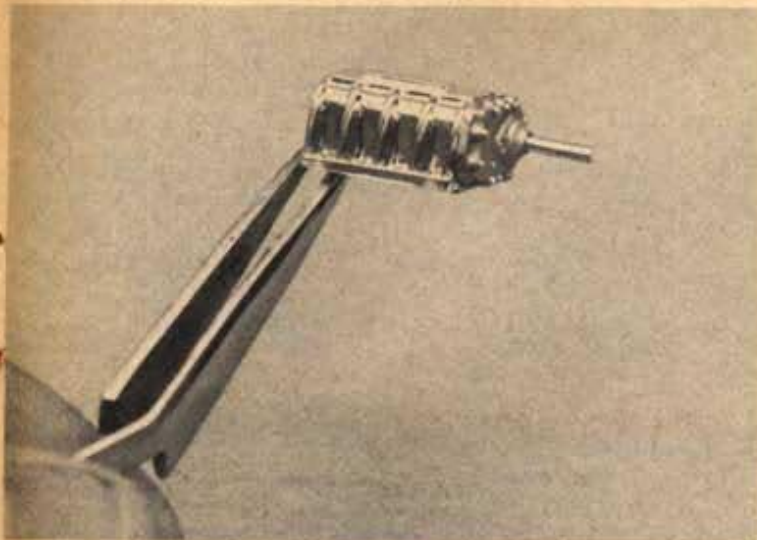
Front plate on one of the engines should be trimmed away to use the plate only. Jewelers saw works best.



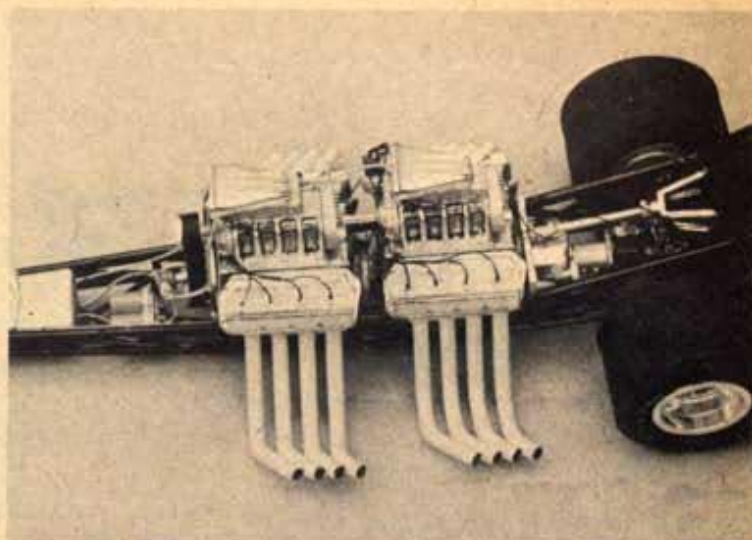
Both engines are assembled. Engine with altered front plate has clutch housing mounted to it. Rear portion of right hand engine has block painted flat aluminum to represent coupling mechanism.



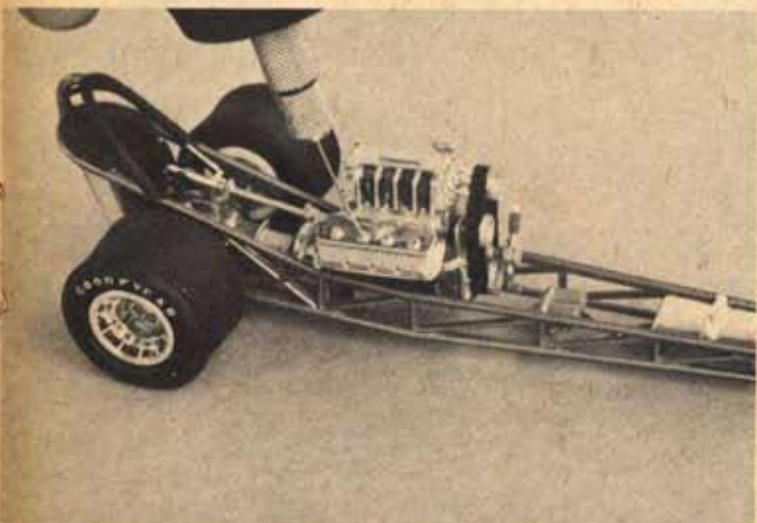
Before gluing injector scoop halves, carefully paint butterfly areas (only). It is much easier to paint them separately.



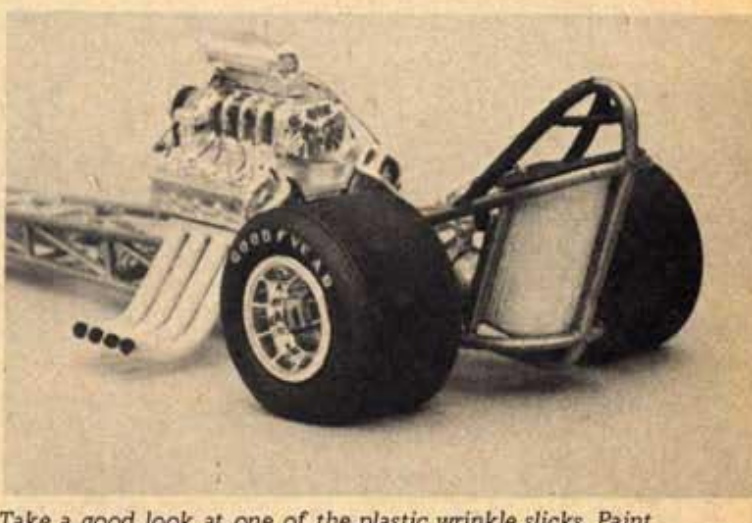
Cut a 1/4-inch length of small round chrome plastic and fit to blower on rear engine.



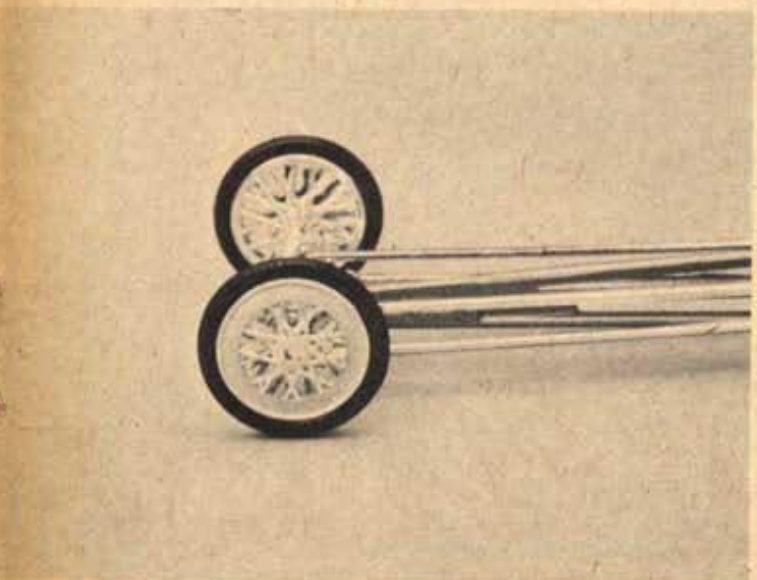
When engines are glued into place, glue the blower shaft from rear blower to back plate on front blower.



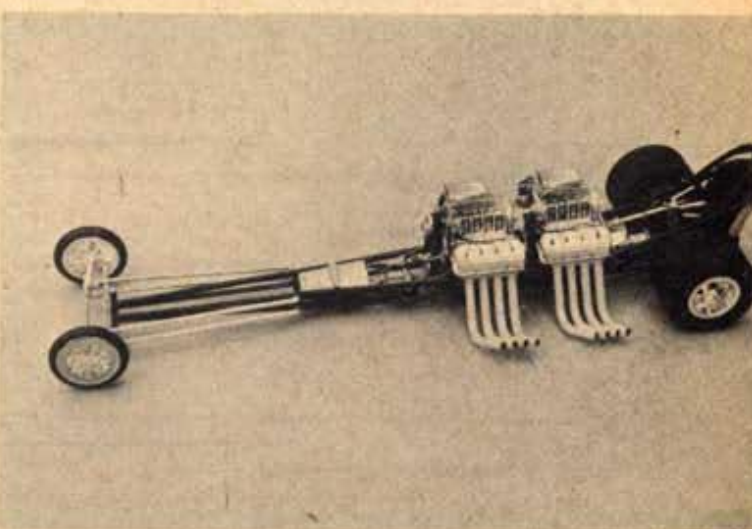
If you plan to wire the engines, it's best to drill very small holes for each thread. A drill of about No. 72 or No. 74 works best.



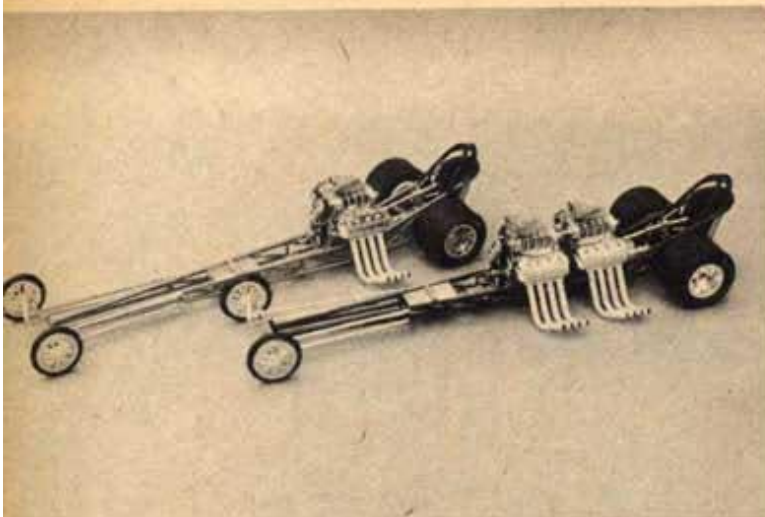
Take a good look at one of the plastic wrinkle slicks. Paint tires flat black, then hit top of lettering with a file to remove paint and produce white lettering. Back of seat is painted aluminum color.



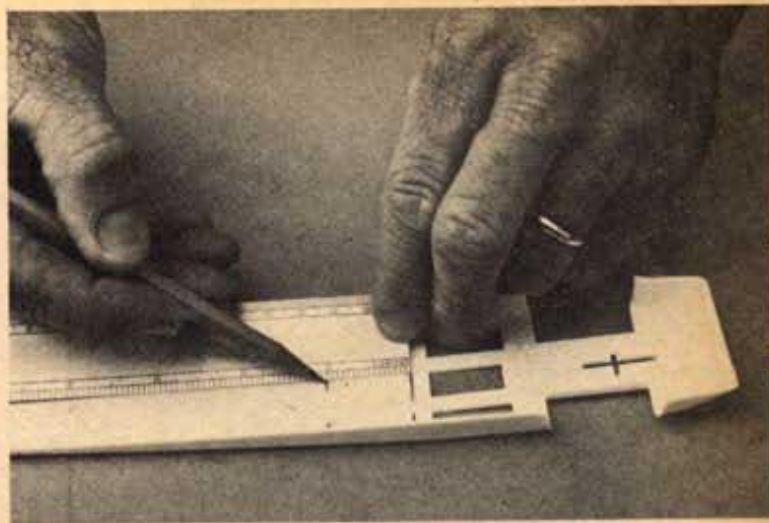
Add realism by painting small aluminum disc on left wheel spokes flat aluminum color.



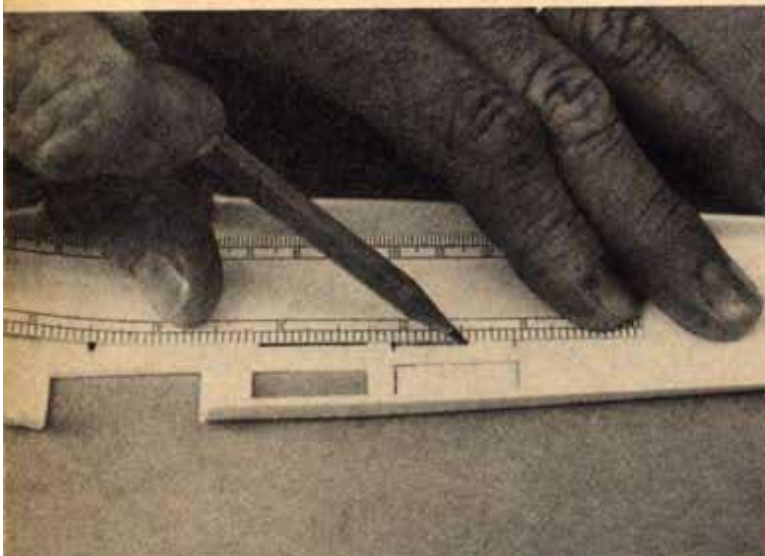
The steering wheel grip and hand brake handle are painted with dark flat brown paint. Oil filter cartridges are orange with the cover area in flat aluminum color. Fuel tank was painted flat aluminum but top strap was left chrome.



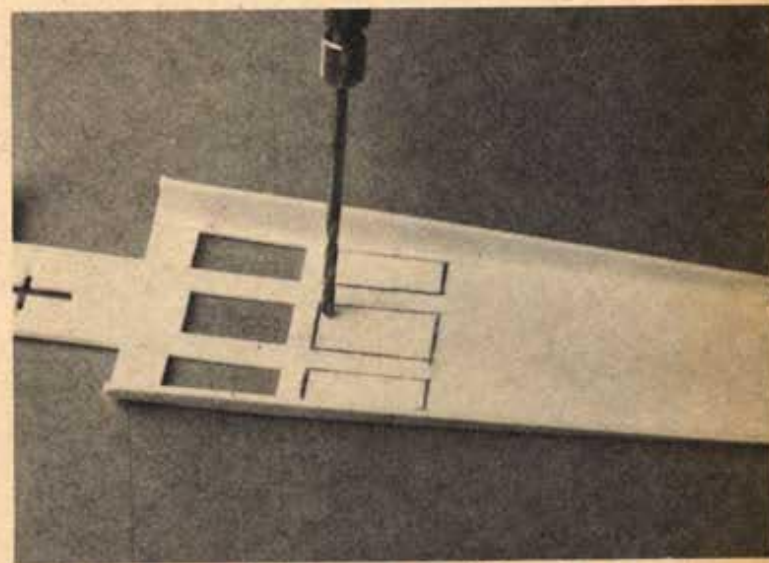
Spark plug wires and injector hoses were made from regular sewing thread (black). Large fuel lines are heavy duty thread (gray).



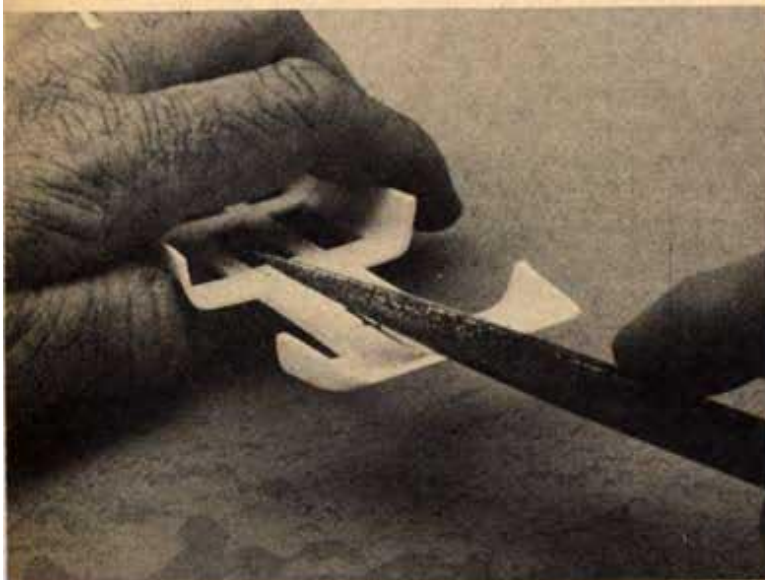
Lower body section must be altered to accommodate second engine. First mark lines $3/16$ -inch in front of holes, then measure off 1-inch for forward edge of new holes.



Align ruler with stock holes and mark lines for new holes. Make sure all lines are straight.

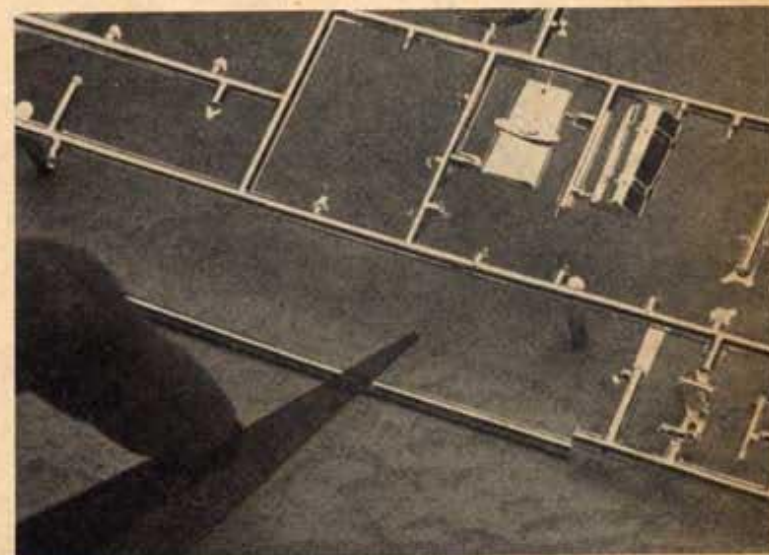


Drill a small hole in each newly marked slot and saw out area with jewelers saw. File edges smooth.

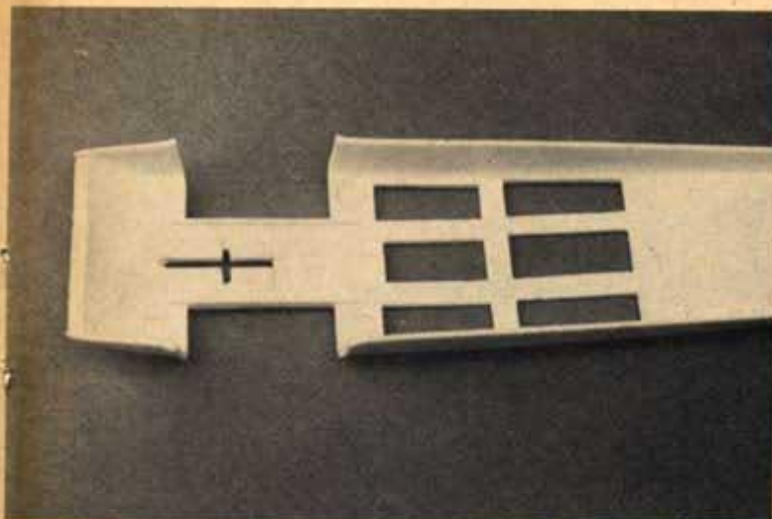


The rear of body must be filed out to accommodate piece of chrome plastic for chromed push bar.

34/Model Car Science



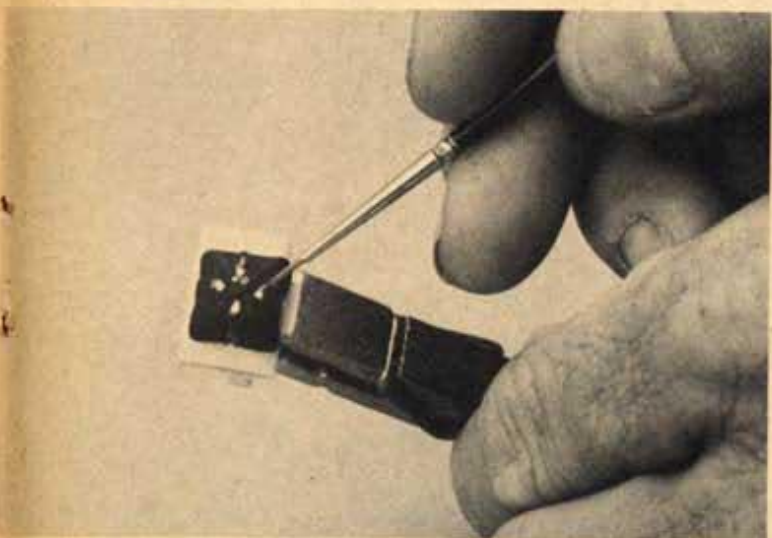
A section of chromed plastic tree in this kit is perfect for the push bar. Cut it to proper length and check fit on body. Then set aside for later.



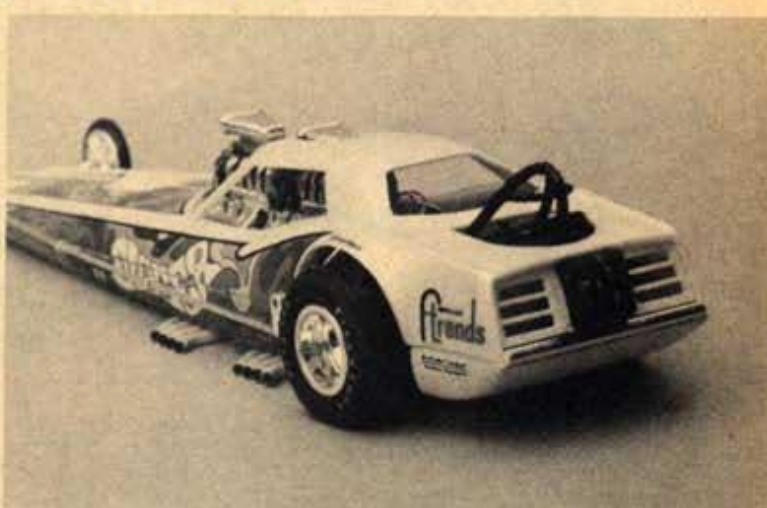
Body modifications are completed and it's ready for paint. Fit body to finished chassis to see that everything fits properly.



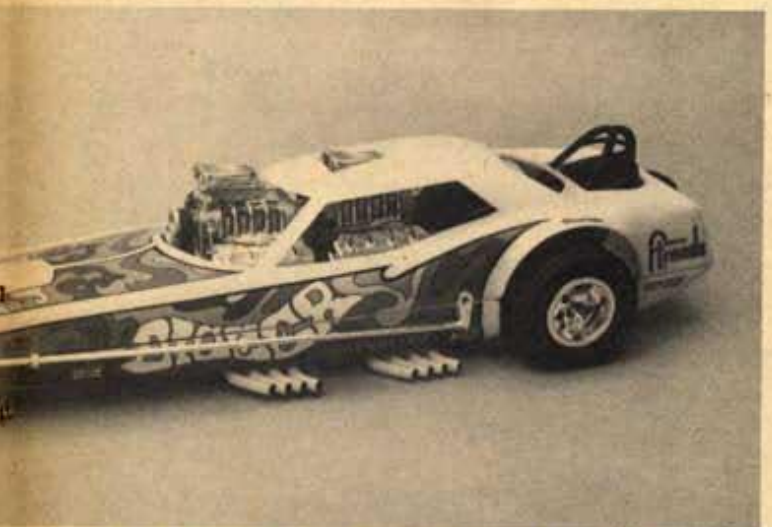
When paint is dry, glue chromed push bar into recessed area. Remember to scrape chrome plating off lower edge of part so glue will stick well.



Drag chute was painted flat black with side straps done in dark flat brown. Metal ends on straps are simulated by painting them chrome silver.



Simple addition of chrome push bar and detailed 'chute highlights rear of dragster. Rear side panel decal was left off to provide space for speed decals. Other decals were placed along lower side panels over top of wild paint decal.



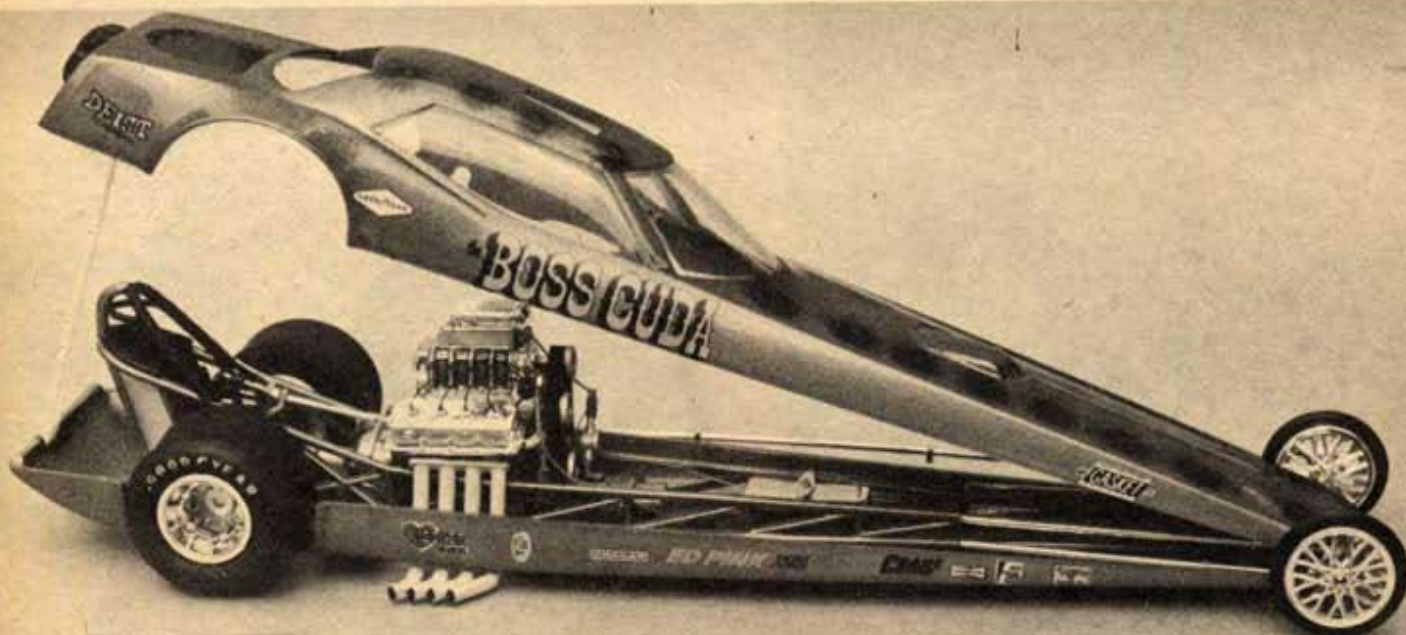
Space is tight, but with engines placed in chassis properly everything fits without altering top half of body. If engine hits lower edge of windshield the frame can be filed some without changing its contour.



Pearl was painted over the white plastic body, then the wild paint decal was applied. Headers are flat yellow.

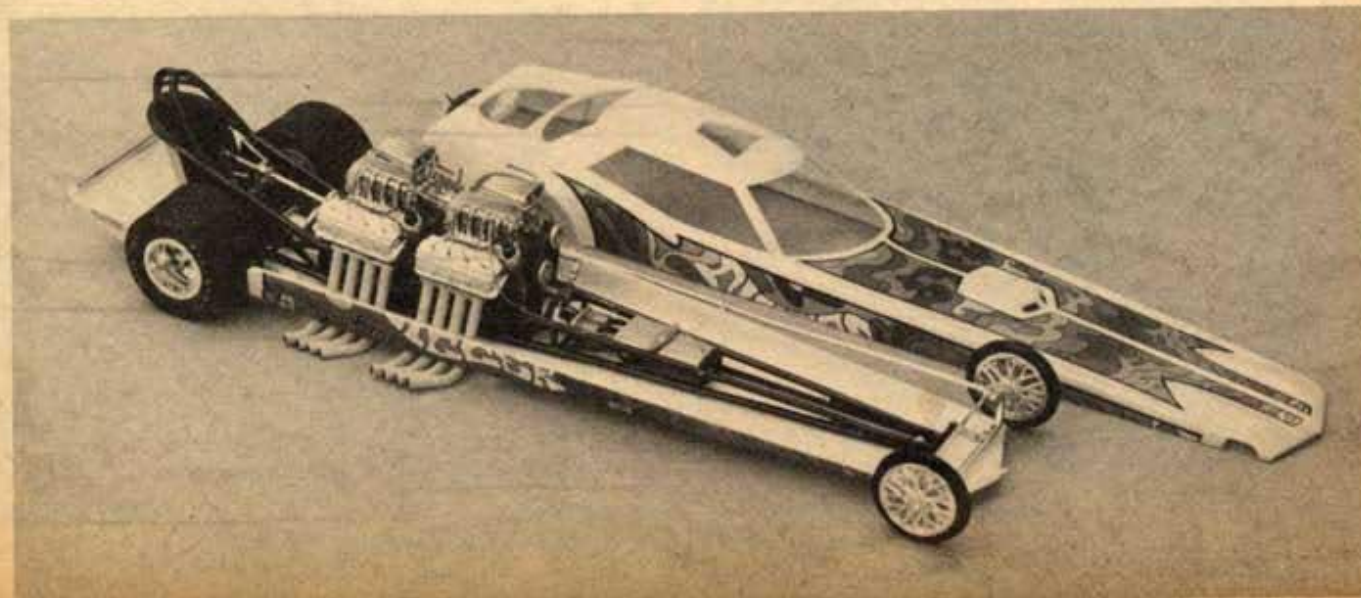


Shown is the stock kit with a wild candy gold and lime green airbrush paint job. Plastic Goodyear wrinkle slicks are from the AMT '71 Mustang kit.



Body halves were not glued down so body can be flipped up for viewing chassis detail. This also looks like real funny car.

Wiring up a twin-engined car is practically the same as a single. Wire each one and connect the two injectors with an extra heavy duty thread. Regular thread connects mags to shut-off on steering wheel. Fuel pump can be detailed by using both AMT silver and Mag silver paints.



WIN A \$500 SAVINGS BOND

\$500

Groove on this: all you have to do to win the fantastic array of prizes described on this page, is to use your imagination, a 1/43 scale car (pick from dozens of manufacturers' cars such as "MATCHBOX," Corgi, etc.) and a 1/20 scale engine, such as the ones you'll find in MPC's great big scale series.

Okay, you've got a b-i-g engine and a s-m-a-l-l car. Now, graft the two together, somehow, and then start doing your magic tricks. Customize until you're just plain customized out!

The wildest cars will be the winners. Don't send us the actual cars, however. Send us photos only (the rules are explained, fully, on this page).

There's a lot to shoot for — so shoot! The deadline for entries is January 20, 1971, so better get a move on!



Can you do better than this? If so, you might win a lot of gold. This is one of the MPC "Zingers," the newest rage in way-out cars.

CONTEST PRIZES

FIRST PLACE

A \$500 U.S. Savings Bond

One of every new MPC model car kits for a full year

A Lionel train set

12 flying model rocket kits

SECOND PLACE

A \$100 U.S. Savings Bond

One of every new MPC model car kits for a full year

A Lionel train set

12 flying model rocket kits

1. This contest is open to all modelers, the world over, except for employees of Model Products Corporation and *Model Car Science*, and their families.

2. Your entry must use a 1/43 scale body (any manufacturer's) and a 1/20 scale engine (any manufacturer's). These are the only restrictions; you may customize the car in any way, shape or form.

3. Send one or more black and white

photos (any size) to us for judging, but DO NOT send the model itself. Include a brief description of the car, what has been done to it, and your complete name and address. Send to: MPC Contest, *Model Car Science*, 131 Barrington Place, Los Angeles, California 90049.

4. Send as many entries as you wish. We will select only the best one for an award, and you may not win more than one prize.

5. Entries will be judged on originality

THIRD PLACE

A \$50.00 U.S. Savings Bond

One of every new MPC model car kits for a full year

A Lionel train set

12 flying model rocket kits

FOURTH PLACE

A \$25.00 U.S. Savings Bond

15 MPC car kits

A Lionel train set

12 flying model rocket kits

FIFTH TO TWENTY-FIFTH PLACE

10 MPC scale model kits

A one-year subscription to *Model Car Science*

of design, workmanship, paint, and overall finish.

6. This contest is void in states where prohibited by law.

7. No photos can be returned. Your entry will act as your permission to allow *Model Car Science* and Model Products Corporation to use photos of your car for advertising and promotional purposes.

8. The deadline for your entry is midnight, January 20, 1971.

THE FERRARI 512 "DAYTONA"

By Ben Millspaugh

This month, let's analyze one of the giants - the Ferrari. There's also a giant size task ahead of you if you want to recreate the spine-chilling lines of the Ferrari 512, the factory entry in the Daytona race. The car came to Daytona in this configuration: It had a 60 degree V-12 DOHC engine that produced a bhp of 550 at 8500 rpm. The displacement was 4994 cc and the high revving V-12 pumped out 350 lb-ft of torque. The transmission was a five-speed with a limited slip differential at the final end. The chassis was a mixed tubular and monocoque structure connected to fiberglass panels. The front suspension featured unequal-length A-arms coil springs, tube shocks and an anti-roll bar. The rear suspension had upper transverse links, reversed lower A-arms, coil springs, tube shocks and the anti-roll bar. The race weight was 2070 pounds. The overall car was basically similar to the 312-P except for the wings and diaphanes added for high-speed stability.

If you are a real bug on detail, I would suggest that you write the editors of *Road & Track Magazine* and request a copy of the May 1970 issue. This magazine, the best of its kind, has a full two-page drawing by Werner Buhrer, on the Ferrari 512/S. It is truly outstanding and will aid the building of this model. This drawing was used extensively to get the artistic license correct on the P-4 conversion.

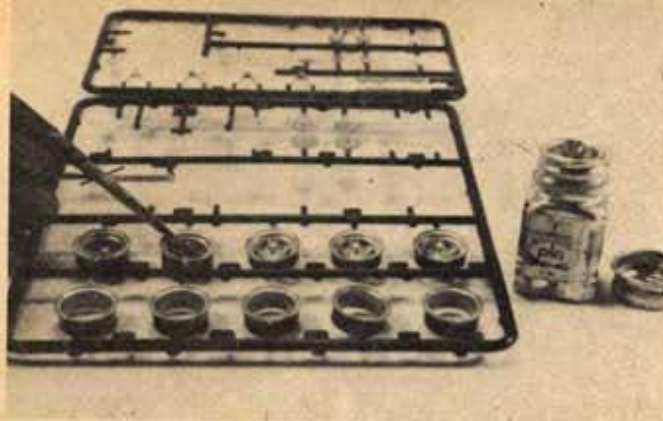
One can readily see from the basic AMT-Heller P-4/Porsche 907 kit that the Ferrari needs to be widened. This is not an easy task, as any customizer will tell you, and it requires some modeling experience to do it right. However, if you will try to see how I did it, here, you might try your first really big conversion.

This conversion requires a lot of putty, and some Metalskin, which can be ordered from the Squadron Shop, Dept. MCS, 21916 John R., Hazel Park, Michigan, 48030. The putty used in this conversion is the popular "Green Stuff," by Rinshed Mason, and it can be purchased from the address above. The putty is, I believe, \$2.00 a tube (one full pound) and the Metalskin is \$1.00 for the two large sheets. The sheet styrene used for fins, fillings, diaphanes is available from most plastic companies. The Squadron Shop produces a packet that comes in handy and it sells for \$2.00 for a pack of six big sheets of various sizes. For a primer, I would highly recommend the Martin Senour No. 7865 Crisp Sand Lacquer Primer-Surfacer, which is available from any of the 4000 NAPA Jobbers across the United States.

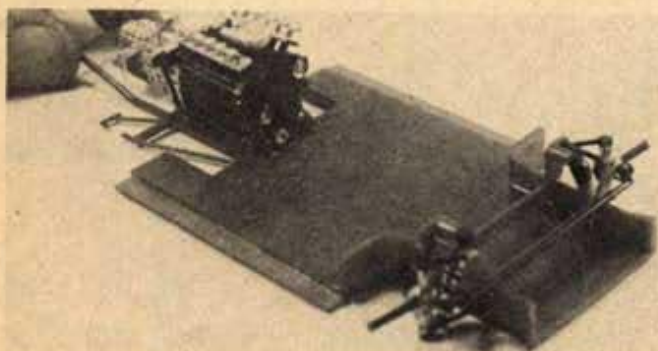
Since this little Italian missile requires so much time and effort, let's get under way. First, let me recommend that you obtain an old wood-burning pencil set and convert the tip to take an X-Acto knife. Or, write to Auto World and get one of their pre-made versions. This will help in the "deep-cut" portions of the article.

Daytona is a big race, a fast course, and it demands the most of its competitors. This year it was a dual between two giants, Ferrari and Porsche.





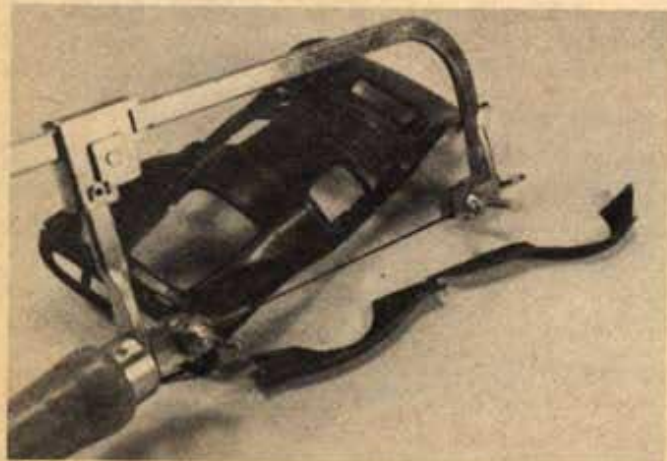
The "wheel tire" is removed from the kit box and painted silver with either Testor's silver brush paint or their outstanding silver spray paint. The parts, such as inner body panels, pedals, roll bar, etc. are all painted flat black, either by brush or flat black spray.



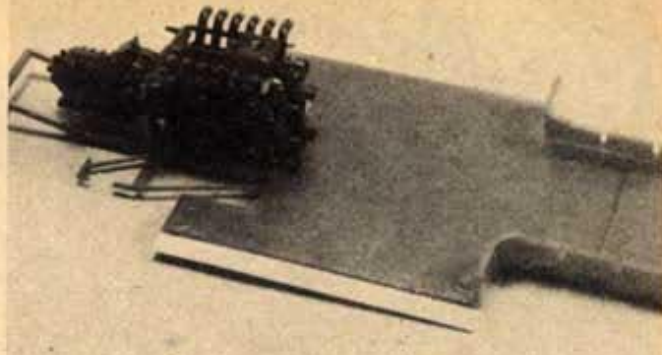
The engine is detailed with silver and black paint and along with the front suspension, installed in the lower frame member. Note that the spindles on the front suspension have been extended. These pieces were cut from spare tree section.



The two "half heart-shaped openings" (template No. 5) on each side of the rear piece were widened by carefully cutting with a No. 11 X-Acto knife blade.



An X-Acto jewelers saw was used to carefully cut along the strip of tape. Make the cut slow and make it straight.



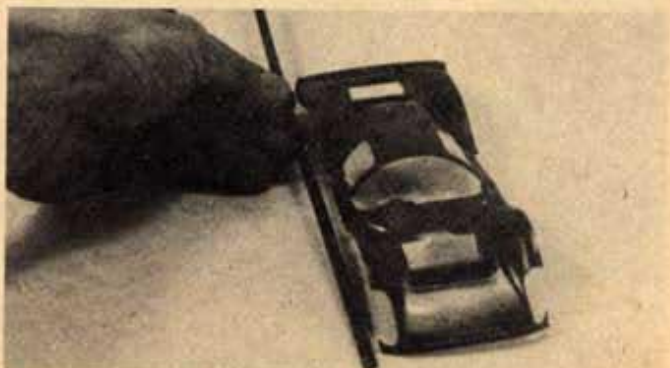
The completed engine, according to the kit instructions, is temporarily pre-mounted in the lower pan for fit check. Note that two 3/16-inch pieces have been cemented to the lower pan to allow for the forthcoming body sectioning. After the pieces have been cemented into position and have been allowed to dry, paint the lower frame member with Pactra's Insignia Red, number S7.



The large box members on the rear portion of the upper body, were cut at the point of attachment.



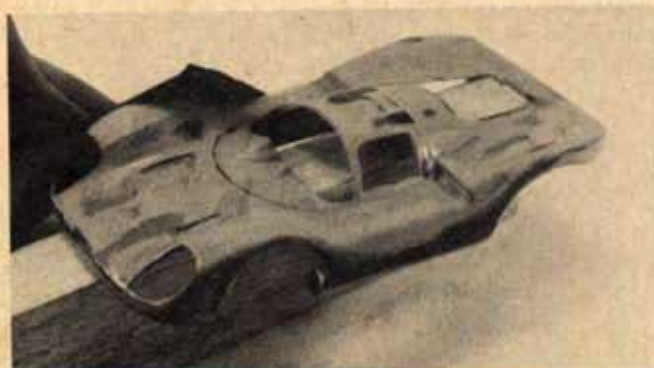
The entire body is now assembled into one piece. I would recommend that you reinforce the seams with small pieces of sheet styrene. Let this thoroughly dry and harden before proceeding. A strip of 1/8 or 1/16th striping tape, such as Chart-Pak (found at most art and engineering drawing supply stores) will aid the longitudinal sectioning of the fender line. Draw the tape from one end of the center line of the fender to the other and gently press into position.



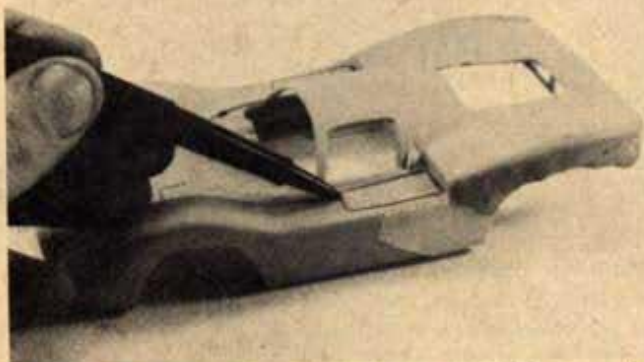
A piece of 3/16 styrene is sliced, using a common paper slicer, and carefully shaped to fit the fender line.



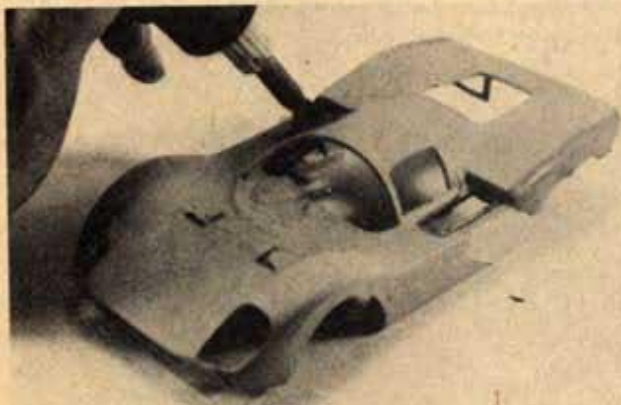
Here we can see how the "fender-sectioning" looks when the outer panels are cemented into position.



The entire body is now shot with several coats of tap water heated Martin Senour Primer Surfacer. Then using No. 320 wet-or-dry sandpaper, carefully sand out the rough spots to get the right general shape.



While the putty is drying, mark a rectangular area just ahead of the rear fender, as shown.



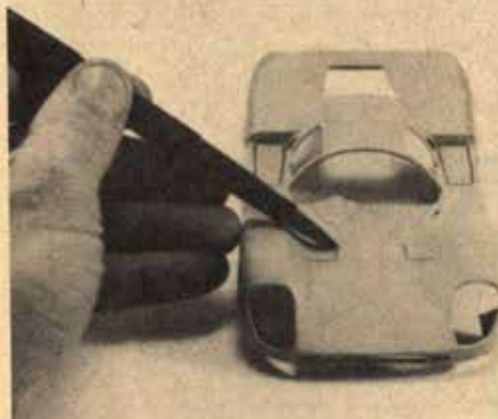
The wood burning pencil, converted to cut plastic, was used to open these areas. They were then trimmed with a very sharp No. 11 X-Acto knife.



The whole area is now puttied using R-M's Green Stuff, along the entire fender line. Study the shape of the fenders in our final photographs to get the general impression of squareness across the fender top. The sides of the body are quite square on the 512. Block sanding with No. 220 wet-or-dry paper is necessary to bring it to the correct shape.



Since the rear fender had a "blown-out" shape just above the rear wheel opening, I used a piece of masking tape to mark the leading edge of this line and then filled the area behind it with putty.



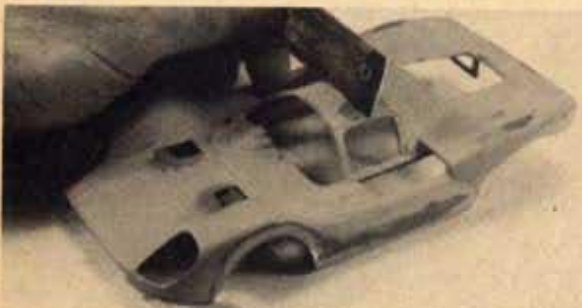
Then mark two "L's," about 3/4 inch ahead of the windshield area with the lower leg of the "L" touching the inner fender panel.



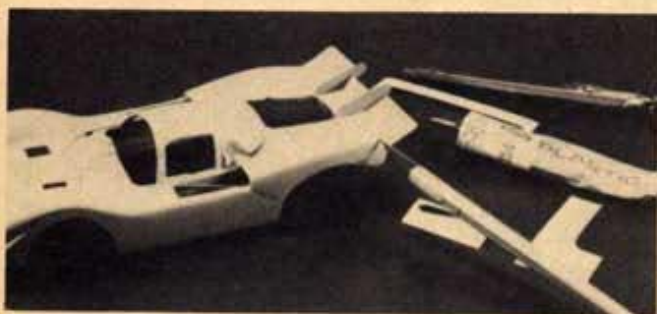
A piece of plastic was inserted into the "L" to "lift" the front edge. Then the area on the leading edge was puttied to get a raised effect.



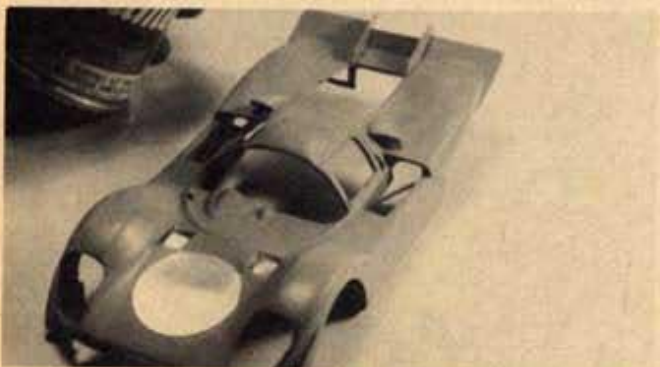
The grill of the P-4 is cut out at the lower edge . . .



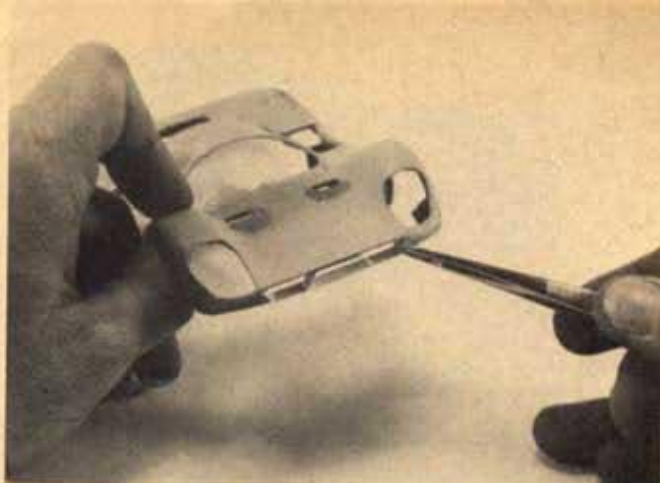
A glob of putty was slapped on the front edge of the roof and shaped to the form clearly seen in the photo picture of the real car (No. 2).



Two large sheets of .010 styrene were used to make the rear spoilers. The inner "rudders" were cut to shape, installed and a small blade was inserted between them. The front diaphane are installed at this point.



It can either be installed now, as shown, or installed later after painting white for the base of our front decal number. The entire finished body is now carefully rubbed down with No. 000 steel wool to bring things to a super finish. Small details such as putting Metalskin inside of the openings of the front vents and a cross bar inside of the radiator openings and final shaping of the headlight openings will get our model ready for painting. Again, Pactra's Insignia Red is used.



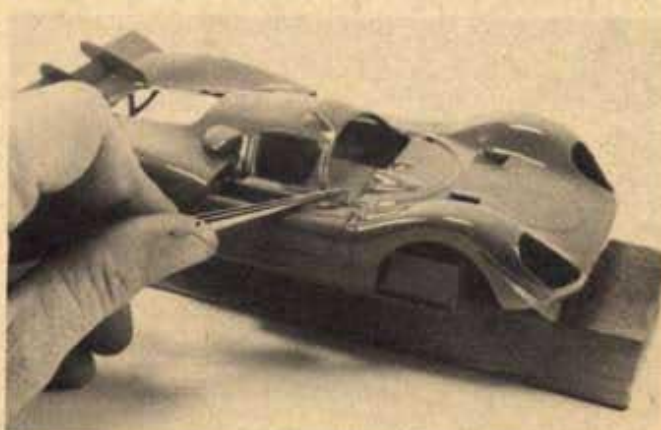
. . .and two "U" shaped pieces of thin styrene were inserted as shown.



Pieces of balsa were used to cut the side scoops to shape. Careful examination of the drawing in photo No. 3 will give the correct shape of these scoops. The balsa was then filled with several coats of balsa filler and sanded.



Using the sheet of Metalskin, mentioned in the text, and a lid from a bottle with a 1 1/4-inch opening, trace the front tire cover on the Metalskin.



You can have your body panel lines two ways. First, you can put your body panel lines on with 1/64th striping tape before you paint and the primer color (I would suggest a flat black undercoat) will show through when you remove the tape after painting. Or, you can simply put the tape on after you paint it the color coat. The first suggestion is more realistic.



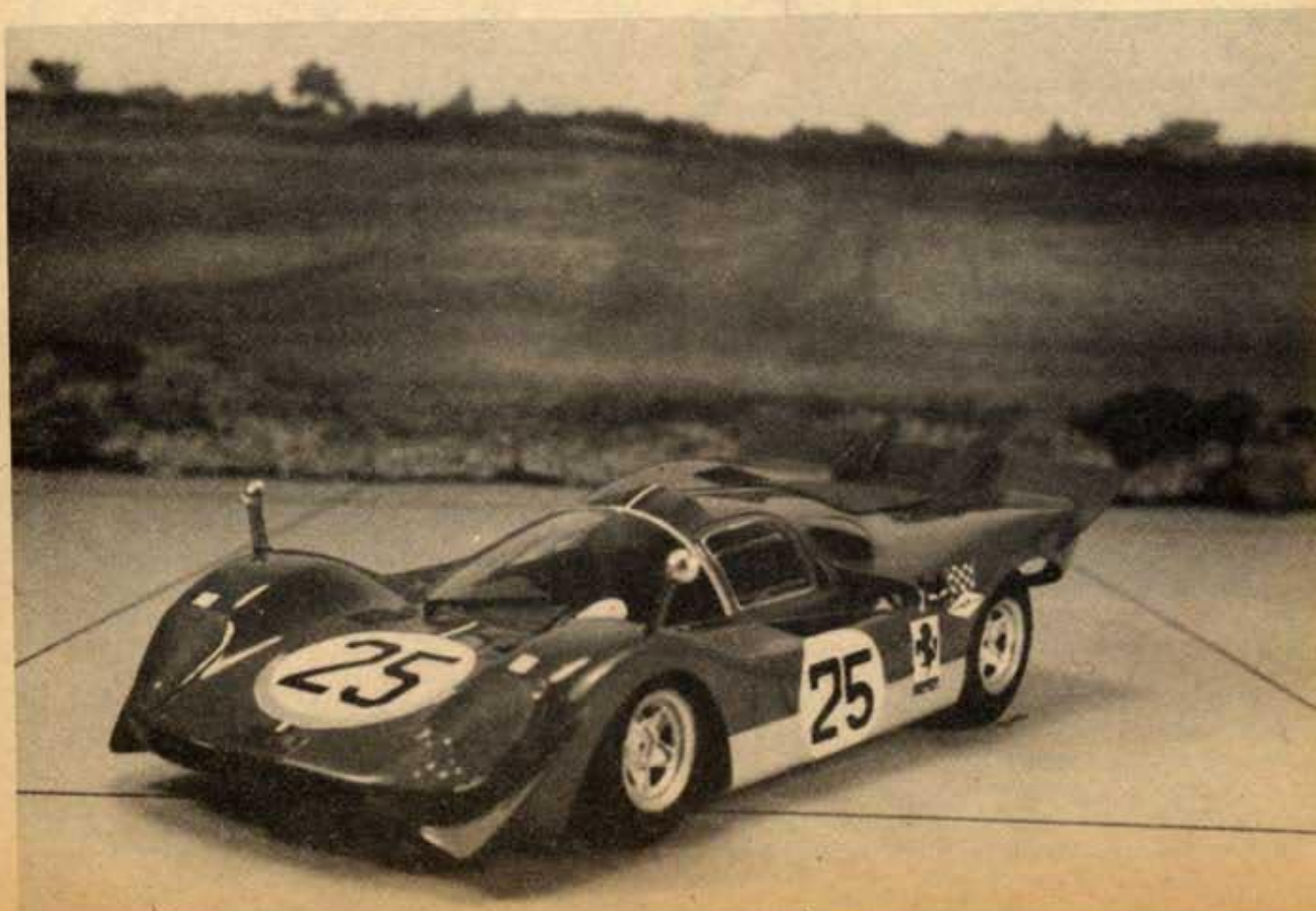
The Metalskin covers the lower half of the side of the car beautifully and the point of a common pin will insert the rivets.



Auto World sponsor decals and Microscale No. 90 decal sheets were needed to detail the correct shaped numbers for the car.

TIPS & POINTERS TO AID THE MODEL BUILDER

1. Insert the plastic pieces of the body sectioning for the gain in width.
2. There will be a gap noticed on the headlight bottom area. This will have to be filled with plastic scrap (cemented) and then putty placed over the bridge.
3. The putty should be placed over the hood opening so as to cover up the edges (raised) but not lapping up over the wind-shield area.
4. The area just behind the front fenders should be heavily puttied to give the "squared" look desired. The P-4 was rounded from the greenhouse area down to the midline. This is going to have to be changed. A small plastic piece shaped like a pennant should be inserted in the side scoops to act as a bridge for the putty.
5. The fenders must be heavily puttied to cover the irregularities in plastic sectioning.
6. Let the whole car now set for two days.
7. If the car is basically "cool" in feel, the putty is still curing. Let it go for another day or two.
8. A large block of balsa about 2" x 1" x 12" worked very well as a sanding block. This block should have 220 W-D on one side



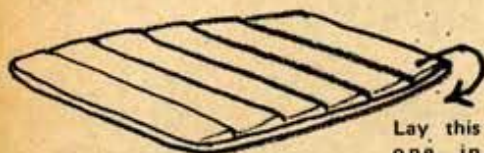
and 100 W-D on the other. Use this block for the "squaring up" of the side. The 512 is flat on the side and all of the roundness of the P-4 should be covered with putty.

9. A smaller sanding block with No. 100 dry paper should be used to "square" off the area between the two fenders. If this area isn't high enough, repeat the putty phase again. Keep building it up to final shape.

10. After two days or longer, you can begin to shape the putty. However, it may take considerably longer for the large areas to dry. Don't get in a hurry. Wet sanding with No. 220 paper will help make faster cuts and if you prefer dry, then use No. 100 on a sanding block.

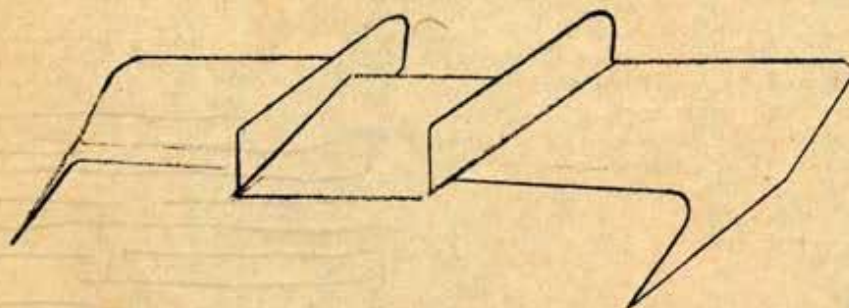
11. The hood will require some special sanding technique. Roll a piece of No. 220 W-D paper and work the fender (inside) area carefully to make it blend with the hood.

12. The rear glass can be shaped by using layers of Metalskin shaped like this:



Lay this one in first and then overlap

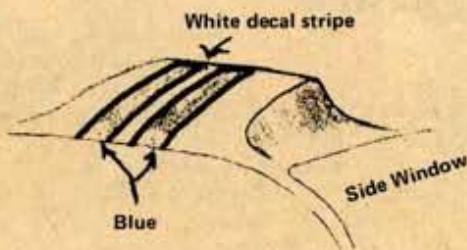
them about 1/32nd of an inch, forward. This will give the desired louvered effect.



REAR SPOILER & RUDDER ASSEMBLY



SIDE VENT SHAPE



Top Vent

13. Metalskin was used, after painting black, to cover the center portion of the grill to cover the headlight (driving) area. Then an X-Acto knife point was used to nick the area to make it look "stone-pocked" as shown in the actual car on the cover of the Racing Annual.

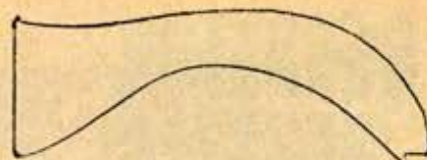
14. The fender wells of the P-4 are much too large, so I inserted a piece of .015 plastic just inside of the wheel well of both the front and rear (see templates one and two). Then the area was puttied to bring the fender area out from the insert. Use the template shown on the template page for the insert.

15. The template for the headlights was used to make my cut from a piece of flat-black painted Metalskin. The backing was then peeled off, after the entire car was completed, and laid over the headlight opening.

16. The rear-view mirrors were placed up on top of a 3/4 inch tall piece of sheet stock. These were painted silver and the "pole" was painted red.

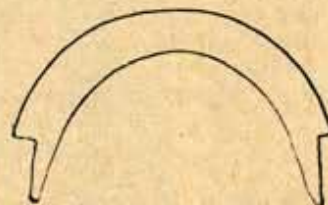
17. The Ferrari decals were not easy to come by. A simple modification of the prancing horse used on the Auto World Ferrari decal (Sponsor sheet) to a square piece will be necessary to make it look right.

18. Since the rear end of your car may be slightly different from mine, I have not included a template for the spoiler. You will have to judge what is about right from this drawing and from what you see in the photos.



No. 1

This template will fit inside the rear wheel well and will be bent to fit the rear insert. The template will also close down the area of the wheel well and make it more authentic looking.



No. 2

Template No. 2 encloses the front wheel well.



No. 3

Template No. 3 for front diplane.



No. 4

Template No. 4 for front headlight cover done in Metalskin and painted black.



No. 5

Template No. 5 for the rear piece side openings.

QUESTION SESSION

Q I would like to know if any company makes, or intends to make, any model police cars like the ones that won the December "Model of the Month Award." I have a large collection of souped-up racing funny cars, and a model police car would give the appearance of keeping them in line. I feel that a lot of people would like this question answered in your magazine.

Tom Vidmar
Glendale, New York

A *Johan has a Plymouth Fury that includes decals and details for New York, Detroit, Los Angeles and Chicago. The model is very complete and a blast to build. It really does dress up a display too!*

Q I was wondering if you have any track layouts for H.O. cars.

Eugene Katan
Danbury, Conn.

A Miniature Auto Racing will soon have a complete book of track plans for H.O. scale. If you're not familiar with this excellent monthly slot racing newspaper, send a 6¢ stamp, or 10¢ in coin for a sample copy to Pacific Publishing Group, P.O. Box 1821, Thousand Oaks, Calif. 91360. I recommend it, highly.

Q I would like to know if anybody makes a model of the '69 GTO Judge. If so, could you tell me where I could get one?

Ray Gasparro
Pittsburg, Pa.

A MPC did make one. You might still find one in an out-of-date toy store, hobby shop or dime store.

Q I have heard about new flame-thrower cars from Aurora and from Auto World, but I would like to know if they are available separately and if so, why hasn't Auto World told us. I would also like to know if they will reduce speed any.

Mark S. Holden
Trumbull, Conn.

A The flame-thrower cars are simply T-jets with lights added for night running. Yes, the cars are available separately, but they cost \$4.00 each. For this kind of money, I would rather have a Tuff-One or a TycoPro. The lights shouldn't reduce the speed if you're using a good power pack with plenty of amperage.

Q I would like to know where I can get a Christmas tree in H.O. scale (that works).

Richard Harris
Muskegon, Michigan

A I'm sorry to say that none are available, but you can make one out of grain-o-wheat bulbs, an electric motor, a wafer switch, and some imagination. I intend to build such an item in the near future.

Q I have a problem. I have about 20 cars but I don't know where to keep them. Could you tell me how to show my cars and save space?

Stephen Souring
Worcester, Pa.

A I've got the same problem, Steve, except I've got about ten times that many cars. I purchased a glass showcase, complete with a fluorescent lamp and glass shelves. Each month I "rotate" the models to keep the display fresh. You might find a suitable case for your models at a thrift shop, the Salvation Army or garage sale. Lawyers bookcases are nice, but they may be expensive. An old china cabinet would be ideal. You could also make "shadow boxes" to hang on the wall by using picture frames for the face panel.

Q Where can I get a Revell Tony Nancy "22" Jr. dragster kit in 1/24 scale. I would also like to know where to get a Revell Cal Automotive Fiat "Topolino" body in 1/24 scale. I like your mag, too.

John Mruczkowski
Maple Heights, Ohio

A Wow! You couldn't have picked two tougher things to find. First of all, both of these kits are made in 1/25 scale, not 1/24. The only company left that has not standardized is Monogram. The Topolino body is an AMT item that was sold separately in an accessory pack. You can still get the Fiat as part of the AMT double dragster kit No. T-275.

Q In your May issue, on page 25 of the Model of the Month section, the two chassis photos of the '68 Charger of Allan Koehler, show quite clearly that the bugcatcher is faced toward the roll cage. I have noticed that most funny cars on the strip and their bugcatcher face towards the front. Is Allen's bugcatcher on wrong or does it not matter which way it faces.

Paul Drury
Staten Island, New York

A There is a lot of conjecture as to which way a blower scoop should face. You may have noticed that many Can-Am cars and pro-stockers have the scoops facing backward while others prefer the "ram-air" set-up. The idea is that a low pressure area is developed right behind the scoop which aids in the flow of air. It has been proven time and again that a motorcycle runs better if the carbs are placed out of the air flow. Right now Allen's car may be a trend setter.

Q I'm gonna need your help to find this one. Can you tell me if any model company makes a 1/25 scale, 1970 Shelby GT 350 or GT 500. Also, I like the vinyl roof effect on a car. Can you tell me how I can get this effect without doing a whole lot of work?

Jeff Hett
Wilton, Wisconsin

A The only Cobra I know of in 1/25 scale is AMT's No. T-296. You can build it several different ways and it includes the 428 Cobra Jet Wedge and the 427 SOHC Hemi. The vinyl roof effect is easy to duplicate using real automotive lacquer. Glue two pieces of thread near the gutter on the roof to simulate the ribbing. Spray a coat of dupli-color (Sears) directly onto the plastic roof. The amount of lacquer applied will determine the "texture" of the roof. A lot of lacquer will "craze" the plastic a substantial amount.

Q I would like to know if there is anything that I can make a decal out of a picture. If so, where can I obtain it?

Ken Tompkins
Rhinebeck, New York

A You must live right, Ken! Until recently there wasn't anything available like this. Most craft shops and paint stores now carry a product called "decal-it." Brush a thin coat of the solution onto a picture and allow it to

dry for 15 minutes. Repeat this with about six coats and allow it to set up for 24 hours. Then soak the picture in water and rub off the paper. The printers' ink is now a part of the "decal-it" solution. Place the wet decal on the body and apply another coat of "decal-it." The result is a very nice looking homemade decal.

Q I have a problem. Where can I get a stock kit of a 1966 Pontiac GTO? Also, where can I get a Chevy Van '69 or '70, and can I still get a '67 Dodge Charger from Auto World? It isn't in their catalog.

Horley King
Ventura, Calif.

A Once a kit like the popular '66 GTO drops out of production, you'll stand a slim chance of finding one in a store. Your best bet would be to scout around at some toy stores that have been in business for several years. AMT still makes the '65 model (No. T-286) which could be modified to look like a '66 if you're really desperate. Try placing a want ad in Miniature Car Collector. The only Chevy Van I know of is made in 1/66 scale by Lindberg. If the Charger doesn't appear in Auto World's catalog, then it has been dropped and is no longer available.

Q While looking over MCS's latest issue, I saw Harold Wakefield's '40 Willys dirt tracker in the Model of the Month contest. It looks very much like a '40 Ford coupe to me. Would you look at it again and tell me if I'm right?

Kim Craven
Mocksville, N.C.

A I agree that the car does look a lot like a Ford, but then so does the Willys. Harold claimed that the car originated as a Willys and I have no reason to doubt his word. It would seem like a waste to use a real Willys for oval track racing, since they are rare birds, indeed.

Q I have a few tips for your readers. There have been many discussions about which glue to use. I have found Elmer's Glue to be the best. There is no odor at all, it's very easy to work with, and it's easy to clean off with a damp cloth. Another tip: to get a strong bond with plastic, I weld it using the X-Acto soldering iron. Use

just the tip and a piece of plastic as solder.

John DiDominicis
Astoria, N.Y.

A You sound like a modeler who knows his subject, John. The tricks you mentioned are very practical and are used by professional model builders to save time and avoid mistakes.

Q My TycoPro drop flag wires are constantly breaking. Why? Also, my armature pinion gear slips on my HO "Tuff One." What can I do?

Richard Summers
Soda Springs, Idaho

A I own twelve TycoPro cars and I haven't broken a lead wire yet, so I don't know what your problem is. Perhaps the car came with a "cold" solder joint. You can return it to the factory and, for a nominal fee, they will repair it. The address is: Tyco Industries, Woodbury Heights, N.J. 08097. You can prevent the pinion gear from slipping by first "knurling" the shaft with a pair of pliers and then forcing the gear back on.

Q I'm in the process of building an HO scale track. I have solved the major problems (cars, scenery, and a location), but I need a track that uses only nine inch straights and curves. I also want to know where you got the grandstand for Ridgeroute Raceway.

Dee Rogers
Dillon, S.C.

A The grandstand I have is made by Aurora, but Atlas also has one available. You will find track plans and much more information on track building in the new monthly slot racing newspaper titled Miniature Auto Racing. I recommended this paper to a reader a few months ago, when the paper was just starting. It's growing like a weed now, and every serious slot racer should subscribe to it. You can get it by sending \$1.00 for a three month subscription, or \$2.00 for six months, \$4.00 for twelve months, to Pacific Publishing Group, P.O. Box 1821, Thousand Oaks, Calif. 91360. Foreign subscriptions are sold only by the year, at \$5.00 per year. It carries slot news and "how to" articles in H.O., 1/32 and 1/24 scale.

Q I have a 45' H.O. track in my basement, consisting of about 20' of curves and 25' of straights. It has two 6' straights, one followed by a 6"

radius turn, the other by a Monza bank. Would you recommend purchasing a Super Cobramite? Will the 'mite be able to take the Monza (my AJ's pan won't)? Also, when will Aurora or Lancer make bodies of the Porsche 908 or 917?

Steve Bechtel
Hammond, Indiana

A The 'mite will do better than a Tuff One with a pan, but a stock TycoPro with Hobby House silicone slicks is better yet. If you'd have been a subscriber to Miniature Auto Racing, the new slot paper mentioned above, you'd have found out about Kirby's new H.O. Porsche 917 a long time ago, Steve. It's pretty wide, but it's a Porsche 917, and needless to say, slips over any of the existing H.O. chassis.

Q In the August issue of MCS there is an article about AMT's Peterbuilt trucks, by C.M. Kroack. I would like to know where I could get a model like his, and the approximate price. Can you help me?

Alex Hendry
Whitestone, N.Y.

A "Pete" is an item that should be stocked by any reputable hobby shop or department store. The price is a whopping \$5.00, but then the "Pete" is a whopping big kit!

Q Is the Model of the Month contest limited to cars and trucks only? Give my thanks to Phil Jensen for opening up his article "The Art of Scratchbuilding."

Dave Moore
West Hartford, Conn.

A You can enter cars, trucks, jeeps, dune buggies, motorcycles, etc. In other words, Phil, anything in the automotive line that strikes your fancy.

Q I have a few questions. First, where can I get AMT's '65 or '66 Chevy Impala (both if possible). Second, how or where could I buy an X-Acto knife? Thanks for any help you can give me.

George Towers
Hollywood Hills, Fla.

A You're out of luck on the first count, George. The X-Acto knife can be purchased at almost any hobby, craft, or hardware store. If you've tried the ones in your area with no luck, try the one that Sears sells under the "Craftsman" name.

Each month we receive tons of letters (pounds? Ounces?) and photographs pertaining to the Model of the Month. There are a number of things that you, the entrant, can do to simplify our task.

1. Address the letter to "Brick" Price, Contest Editor, 11795 Gateway Blvd., No. 3, Los Angeles, Calif. 90064.

2. Include everything that was done to the car other than stock from the kit. Too many of our entries lack the information that others are seeking.

3. Describe the paint scheme and brand of paint.

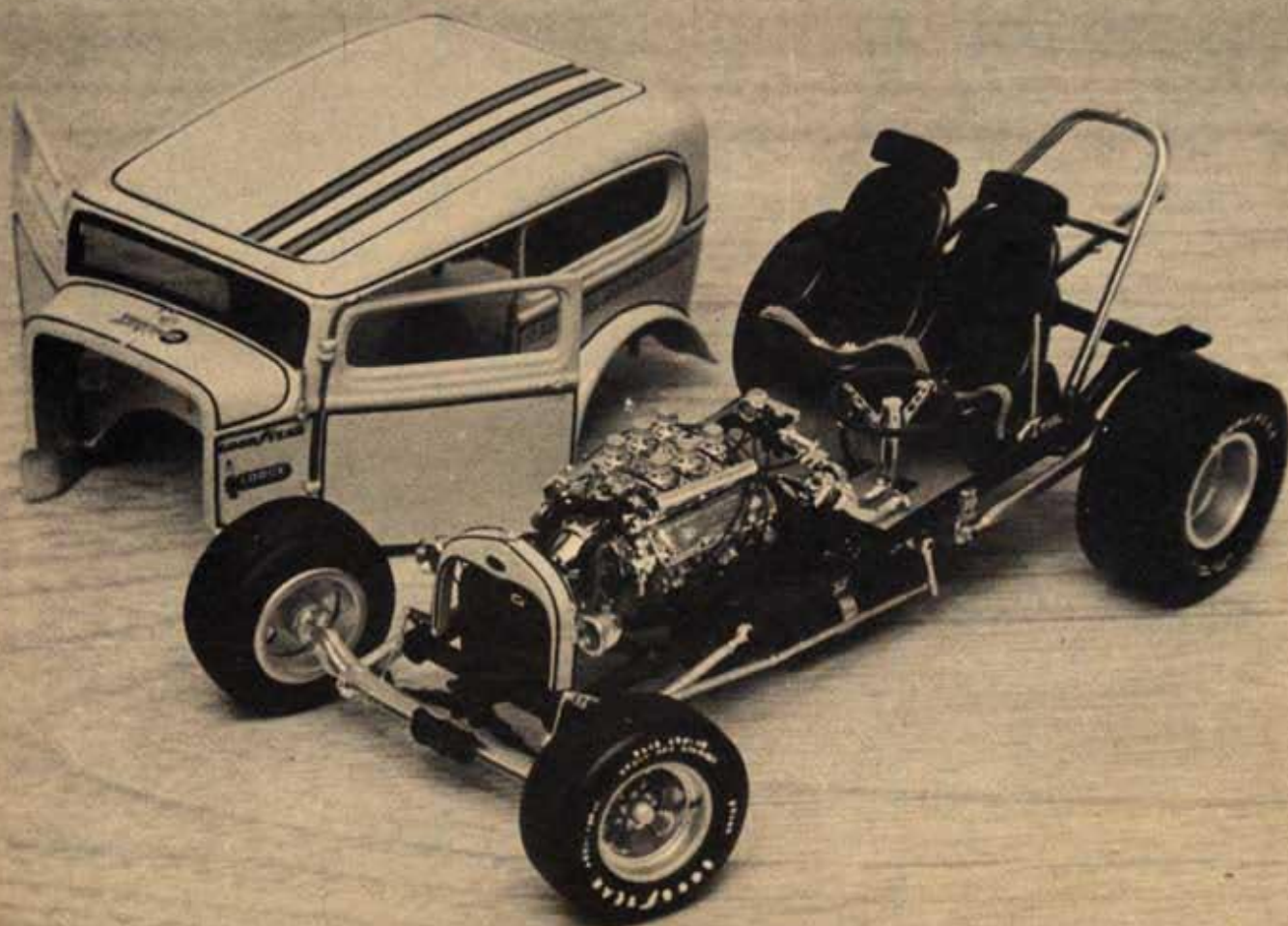
4. If it is possible, please print or typewrite all information.

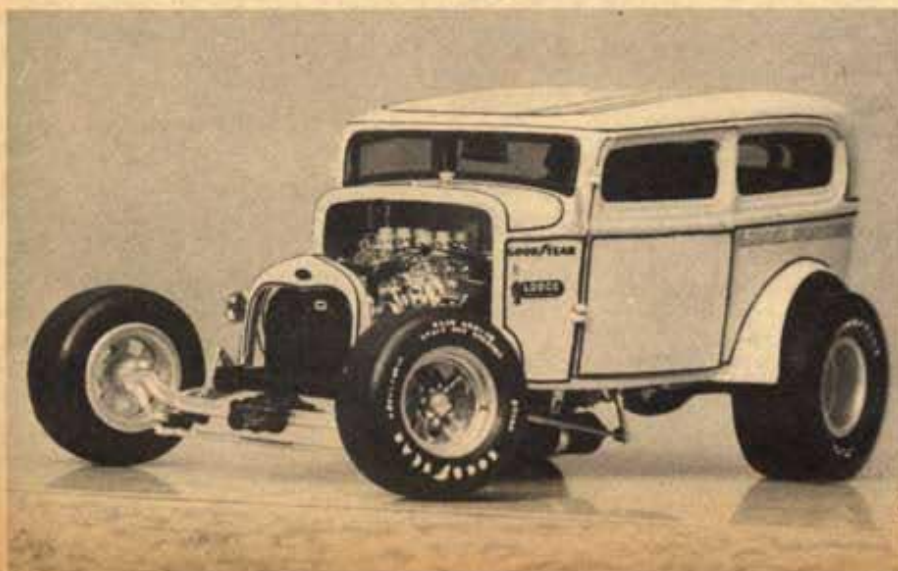
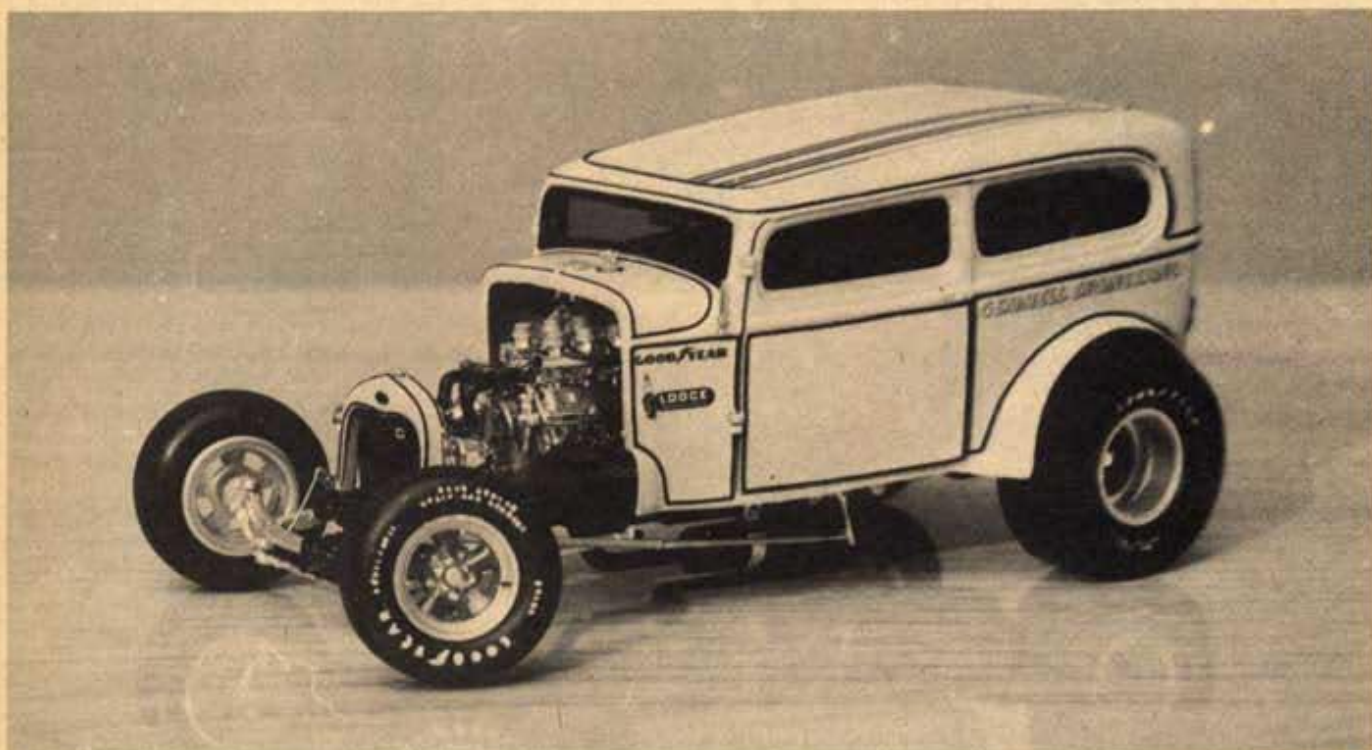
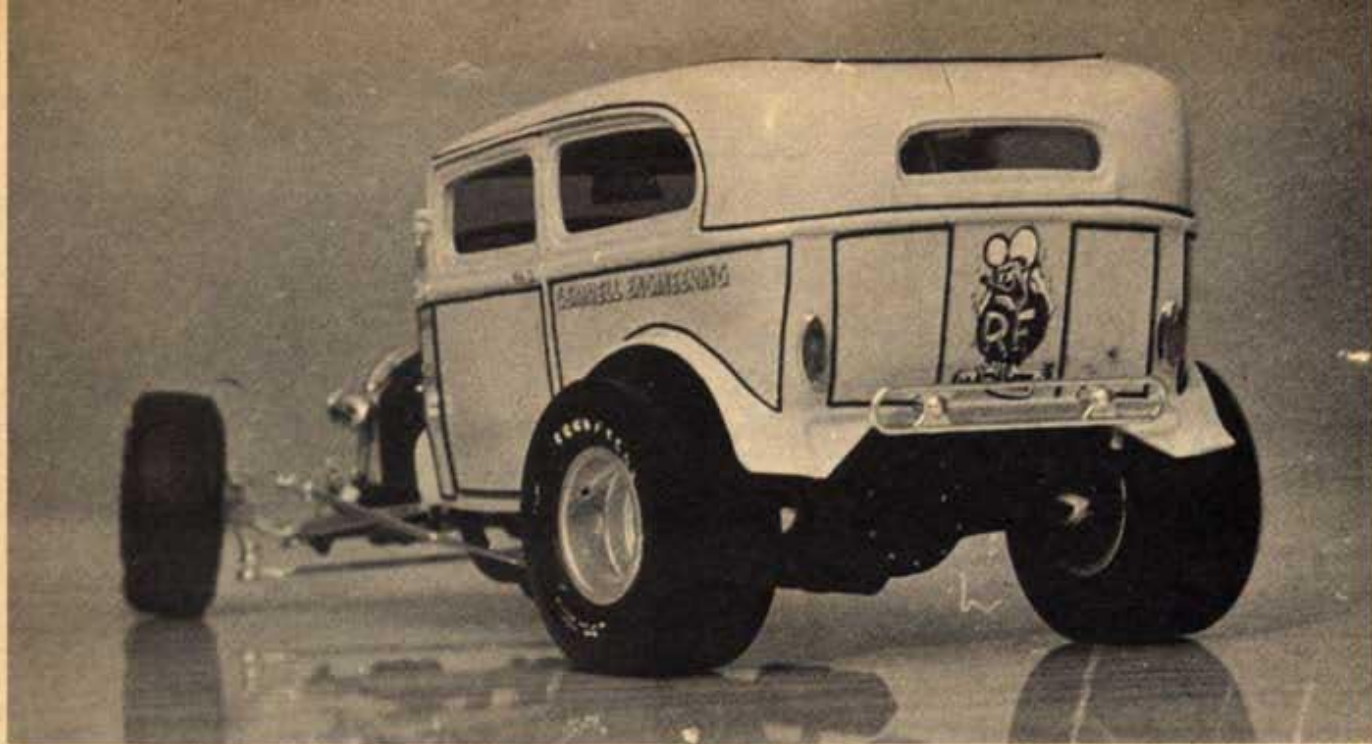
5. Keep your backgrounds simple and uncluttered.

Model of the Month

HERE'S WHAT YOU CAN WIN!

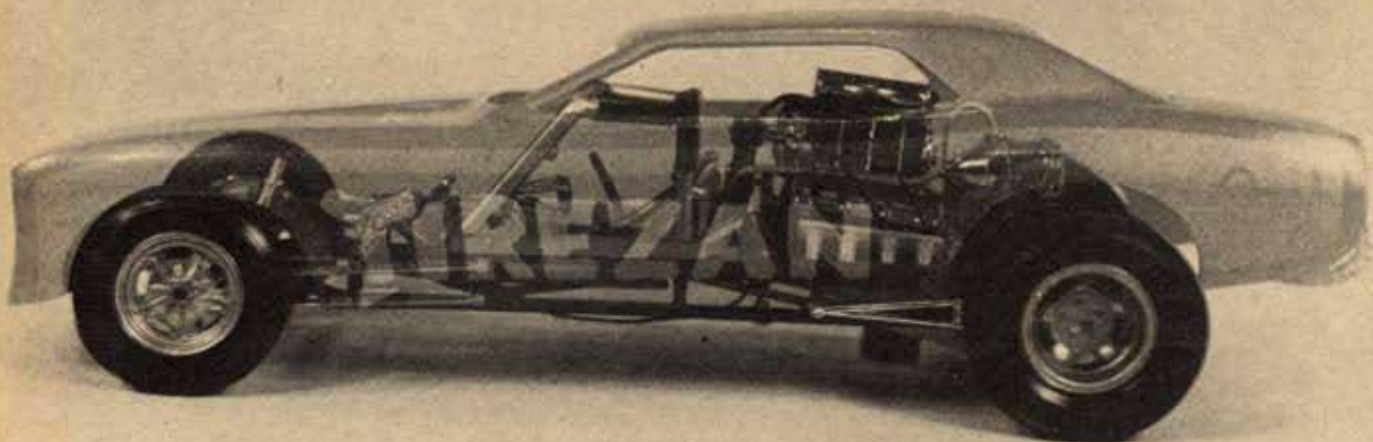
The first place winner of our Model of the Month contest receives this fantastic Dremel No. 261 Moto-Tool kit — a \$32.95 value! The kit contains the following: Powerful No. 260 Moto-Tool, 34 accessories including high-speed steel cutters, grinding wheels, wire and bristle brushes, rubber polishing tip, sanding discs, drum sander and sanding bands, mandrels, dressing stone, finger grip extension, collet wrench and 1/8", 3/32", 1/16" and 1/32" collets, all in a molded polyethylene storage case! A magnificent, life-time tool set that is perfect for modelers.





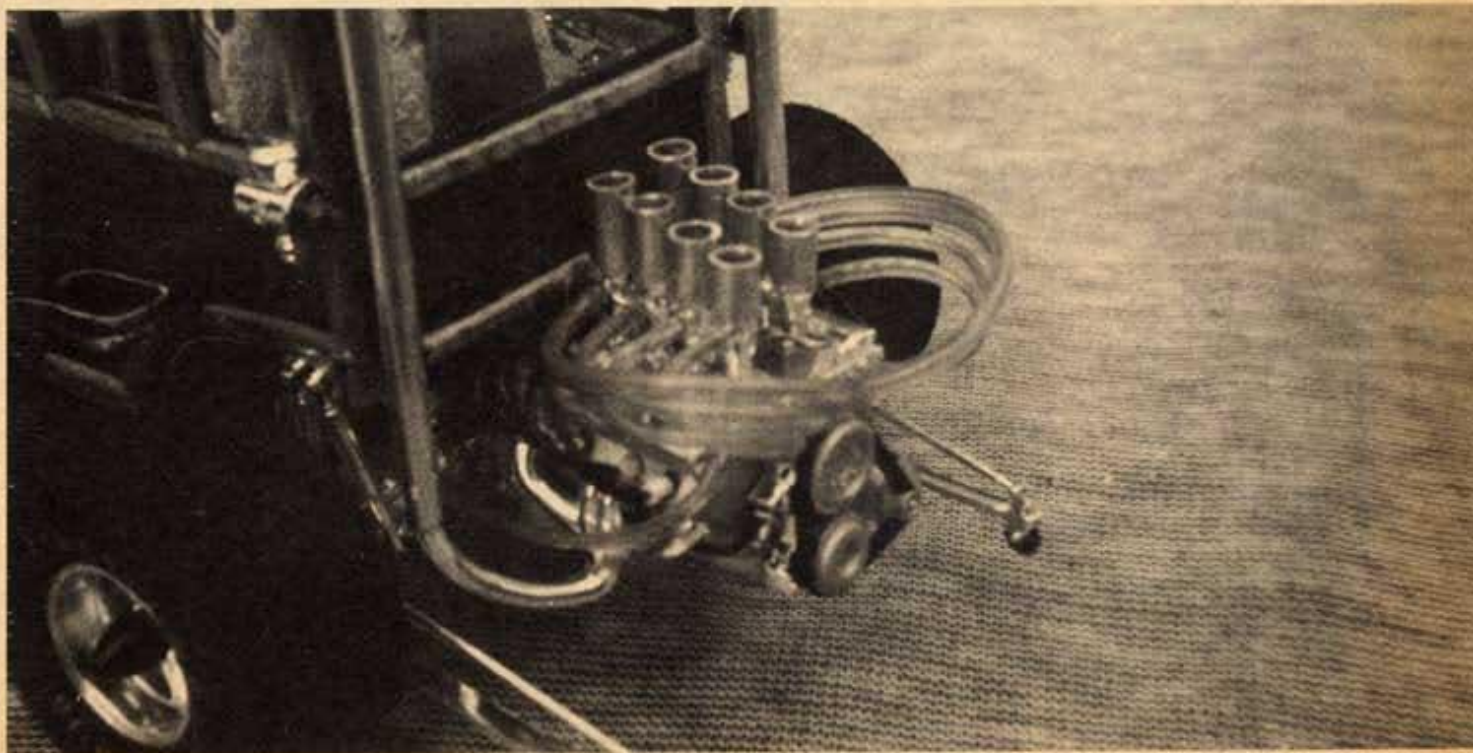
Marc Melone, 4331 N.E. 68, Portland, Oregon 97218, built this month's winner of the Dremel Tool set. Parts from nearly fifty kits went into the building of Marc's "Warlock," but the majority of pieces came from Revell's Orange Crate, Beatnick Bandit and Tweedy Pie. The car features opening doors, steerable wheels, working rear springs, radius rods and shocks. The car is detailed from the looms on the engine wiring to the pin-striping on the body. The body has four coats of gold base, twelve coats of Pactra's Lemon Yellow and four coats of clear. Congratulations Marc, your Dremel Kit is coming post haste.

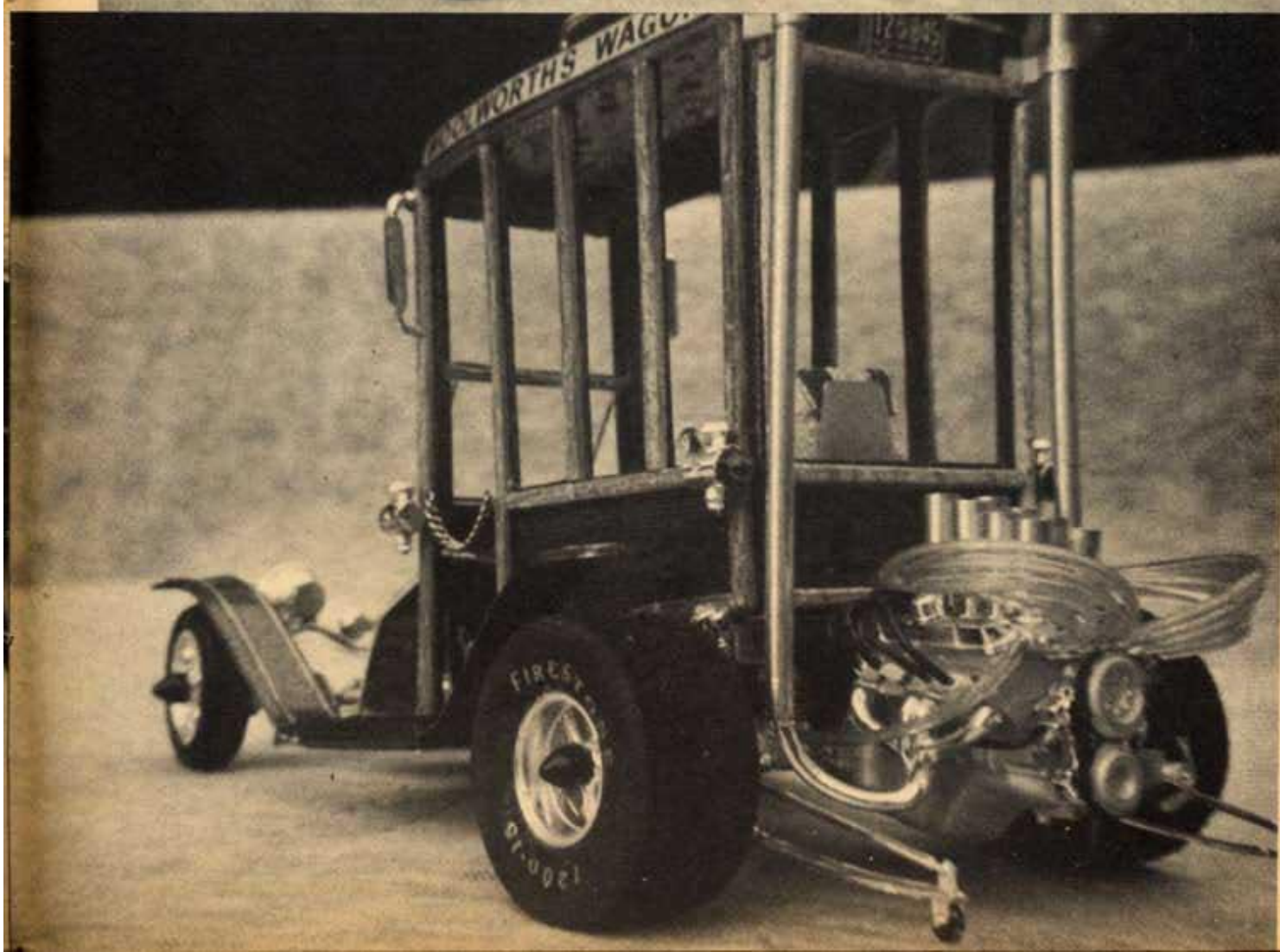
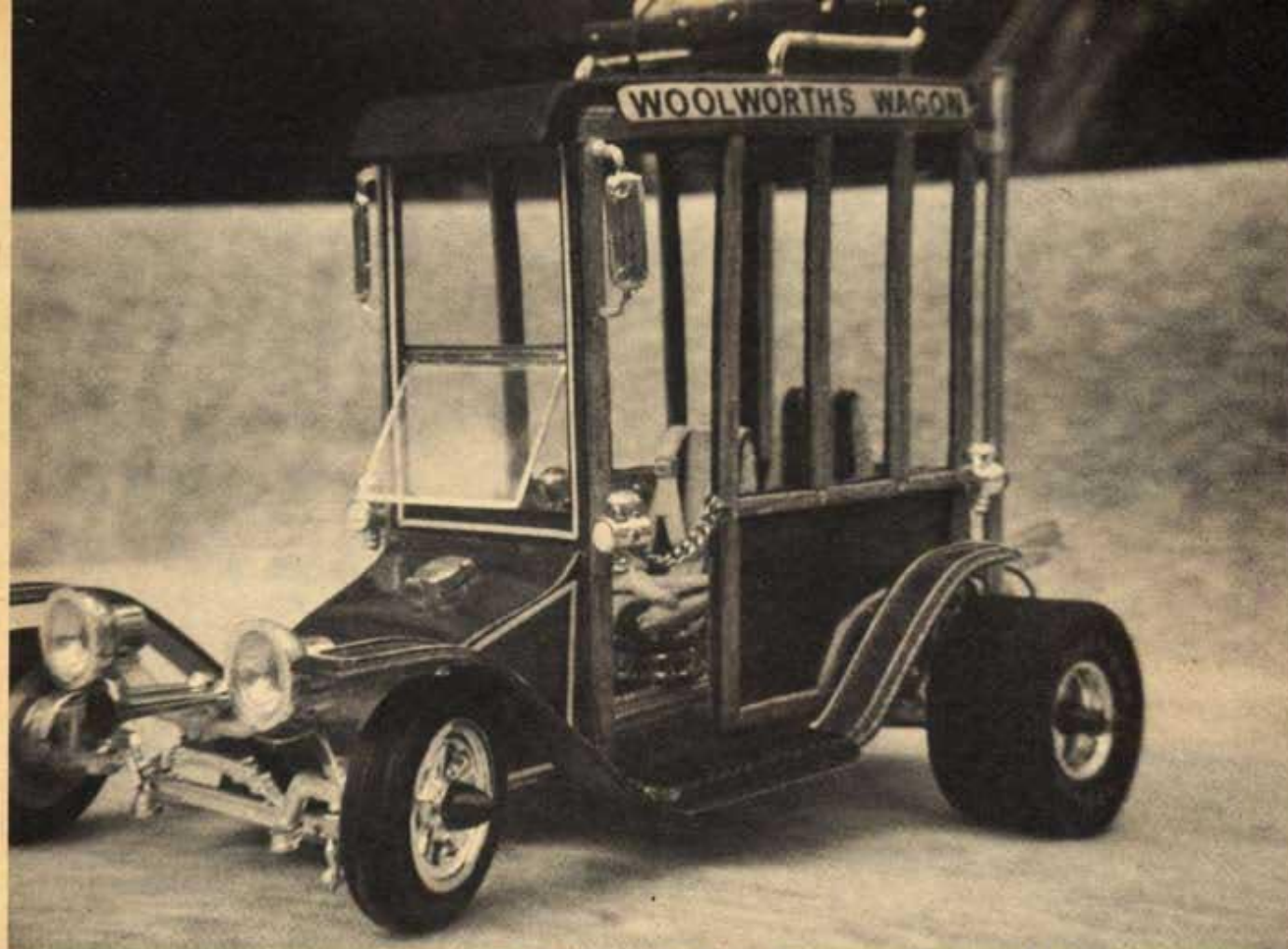
January 1971/47



I was impressed with the unusual photograph of Gary Skelton's car. Gary's "Tirezán" '69 Camaro Funny Car is a conventional model with a painted body but a double exposure picture gives the illusion that X-ray has been used. The body is stock length but the front wheel wells are 1/4" further forward and the top is lower by 1/8". The lettering was done by hand except for sponsor decals. The Logghe chassis is stock but the engine is now mounted in the rear. The interior has been modified to allow the driver to sit lower in the car.

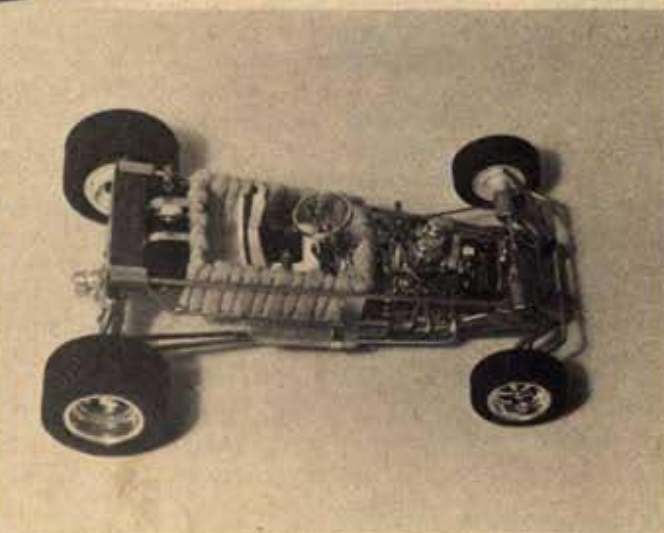
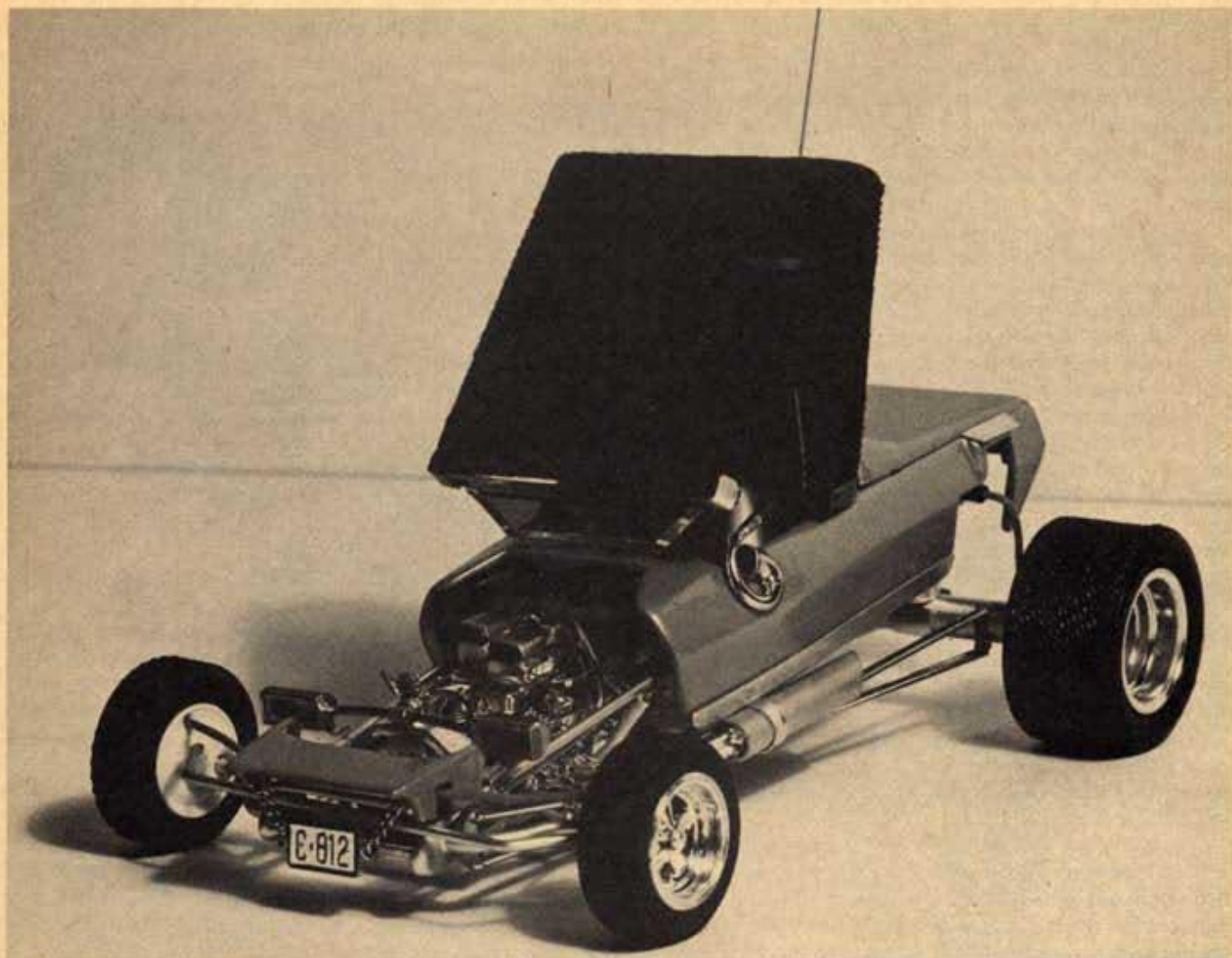
One of the most unusual entries we've received is the bus built by George Bowman of North Olmsted, Ohio. The car was originally a Revell Moonmixer but all that is left of that kit are the fenders and front end. The body is fabricated out of .020 sheet styrene covered with walnut contact paper panels. The completely detailed engine is a fuel injected Chevy with hand-made aluminum exhaust pipes.



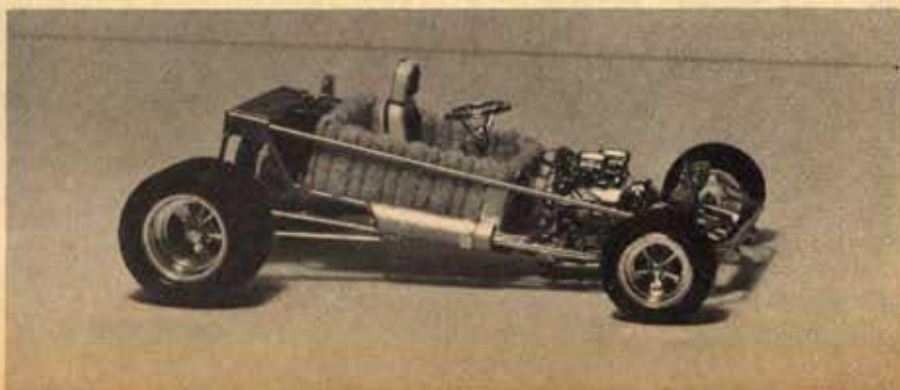




Who else would be more eligible to build a model of a Baja car than a resident of that same country? Eduardo Vallado of Mexico City built this fine Baja car using Revell's Love Bug as a basis. The engine has all fuel and electrical wiring as well as the exhaust pipe from a '68 Corvair. The interior has a roll bar and fire extinguisher from a '70 Maverick. The body has been modified in the interest of saving weight.



Tom Ford of Claremont, California, built this futuristic rod using parts from several different kits and a highly modified surf rod body by AMT. The convertible top is made out of cardboard covered with corduroy. The rear axle is made out of aluminum tubing and the suspension actually works with chrome coil springs. The wheels and engine came from an "Invader" kit.



I want to tell you about one of the finest radio control cars on the market – the Delta Dash II D, out of Delta Systems. If anyone comes close to really understanding this new sport, it's the two guys who form Delta Systems. They aren't the GMs and Fords of R/C but neither are the Halls nor the McLarens of real racing. No, I don't agree with all their design principles, but they have valid reasons for them.

Their packaging leaves a package designer's mouth watering to get on it, but it's very sanitary, very race-equipment like. Every major component and small part is packaged in its own plastic dust proof bag. The instructions are written by the men who designed the car and know it. Baby, they even send the wrenches, and no parts missing, not one washer. You get what you pay for plus. And the price right on the \$100 mark.

I don't intend this article to be a step-by-step assembly bit; the instructions that come with the Delta car are complete and do it quite well. But I am going to lay out the parts for you, and put them together so you can see it in detail for yourself. I'll take it right up to the radio gear installation and then, if the powers that be permit, another article on the modifications I plan, to bring this out-of-the-box car to where I want it for my own use.

We may even do a quickie on the preparation of a one-off body. (*Go man! – Ed.*) Right now, it's the car, and the car is the Delta Dash II D.

The "D" indicates the very latest from the creative minds at Delta Systems. The box the kit comes in is deceptively small, 14" x 5½" x 5½". You almost think it can't all be there, but it is.

From the top you get a 19 page instruction manual that can be understood first time out with both photographs and exploded views. Then you get to those ever-loving plastic bags, containing the goodies. I had a few more than usual, having opted for some extras, but the basic kit will include anodized aluminum pan, front suspension package, power train support, and chassis hardware – all quality stuff. A clutch/brake kit, gear set, wheels and tires, body mounting kit, and accessory package were opened next. The last contained items like servo ball joints, loctite, tire cement, and some more hardware. Now, before anything else, let me stress one very important fact. The hardware, screws, nuts, etc., are all aircraft quality, and so marked. You won't find one little self tapping screw that looked like it escaped from a slot box. Even the Allen wrenches are professional quality tools. Chassis members are all anodized; you may not like the color, but it's better than polishing and lacquering.

Two of the many items that make this Delta kit the "II D" instead of the "II," are a beefier rear axle, now 5/16" o.d. with heavy duty ball bearings, and new formula sponge tires that really should grip.

The car, as you can see from the photos, is a sidewinder, and if slot cars are an indication of the way to go, it's right. That's a personal thing.

The ball bearings, all four (that's two for the rear axle and two for the clutch/brake unit), are sealed quality items. Front suspension is a rugged independent setup ala sliding pillar like the Morgan, if you must. Shock absorbing is by oil, and fully adjustable for toe in, ground pressure, caster and dampening. Tie rod and ball joints are all very rugged – this is a racing machine, not a model of a racing car. If you want heavier, you'll have to go to carb linkage! But I swear, it'll take some trip into the boonies to set this unit adrift.

Well, if it's not Delta Systems, they're certainly in the top two!

Who's no.1 in

Now they don't give you an engine or fuel tank for your 100 dollars but it's made for the Veco 19 or the McCoy (naturally) and the tank can be mounted in a second or two, as illustrated.

Other than the assembly and adjustment required you'll have to do some minor work on the engine, but this is wrench and screwdriver stuff that even mom can do on the kitchen table.

The kit has one feature I don't like, the tires have to be glued on the wheels after you get it. Yes they supply the cement, but I thought it unnecessary. Sure it keeps the cost down, but after you spend this much a few bucks more...

It's at this point, however, that you realize the wheels are feather weight. No, they are not plastic as some have reported, they're nylon and tough as steel. How true is a nylon wheel? A lot truer than some machined aluminum units I have seen from this part of the country. And *light*, oh man you have to see it to believe it.

Now, to get an even clearer picture of what these guys at Delta have created after much designing, testing, racing and more designing, look further. As I said, it's a sidewinder, with the most beautiful centrifugal clutch I have ever seen in this size. It features a built-in brake that has to be a winner. It works off the throttle servo so that when the servo is centered, you're coasting. Move in one direction and you have gas, the other direction and the binders come on. And this unit is standard, not an option.

The Delta option sheet (it's really a catalog) offers more goodies than you knew existed – gear sets from 3:1 to 6:1 (all spur sets, Nylotron turned by steel); heat sinks; air filters; hardware; bearings; wheels; tires, and on and on.

Of all this, I selected one of their new heat sinks, an exhaust system, and air filter. The heat sink, again anodized, is a beautifully machined job, fully ribbed and much larger than the previous model. The exhaust system is a unit designed just for the Veco 19 and goes a long way toward keeping your chassis clean. The air filter body mounts right on the engine inlet with two set screws, and seals positively against an "O" ring. The filter element is replaceable or cleanable, and really is a must.

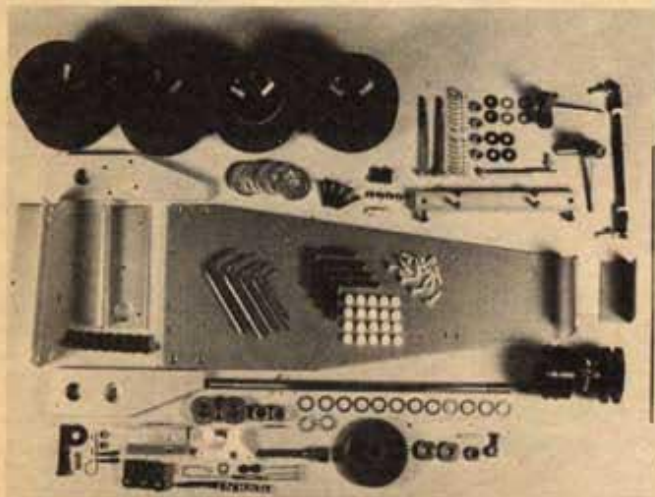
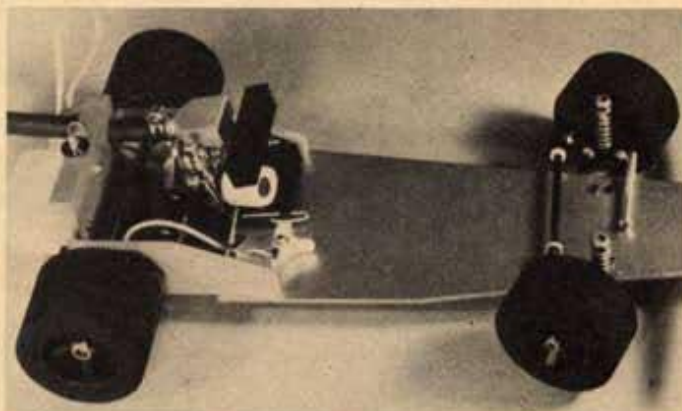
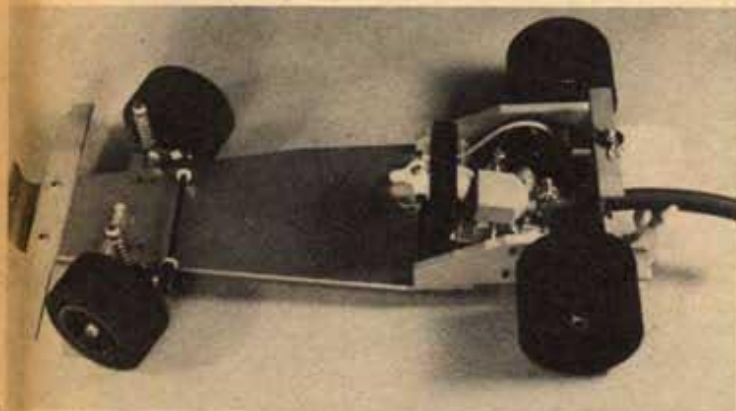
Right now, I'm looking at the sheets of typed copy on this article and I realize that the only way to say it, is that this has to be one of, if not *the* finest R/C cars yet designed, bar none. Certainly it's the best one these eyes have ever seen.

If they ever decide to rename the company, I suggest they go to Quality, and build the Quality Dash II E.

But don't take my word for it, write for the catalog, it's only a buck, and it may hook you too. You can reach them at Delta Systems, Race Car Division, Dept. MCS, P.O. Box 754, Bridgeton, Missouri 63042. And tell them Jose sent you...

R/C Auto Racing?

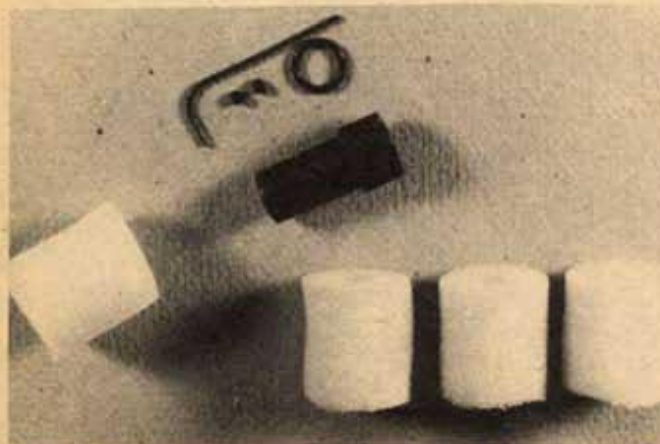
By Jose Rodriguez, Jr.



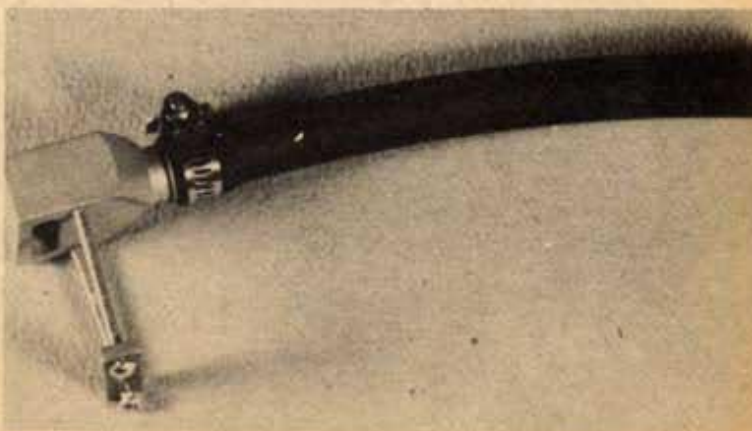
Here are the parts that make up the basic Delta Dash II D kit.



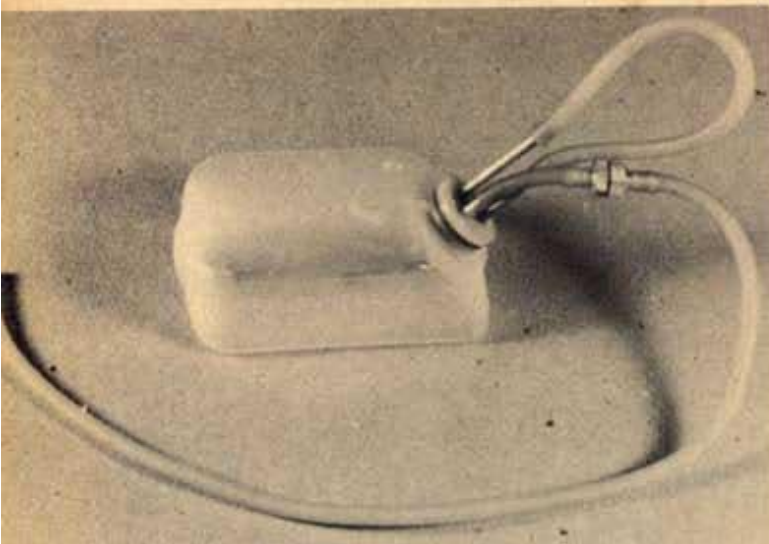
The extras I ordered are pretty impressive, too. The Delta-designed engine heat sink comes complete with new milled head, gaskets and head bolts.



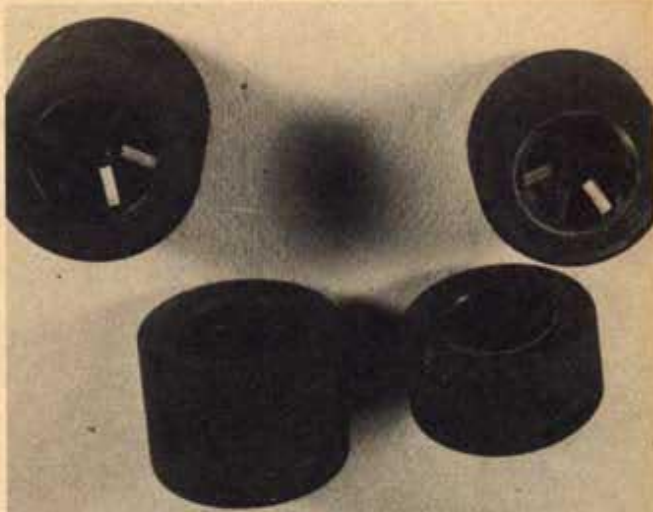
The air cleaner, a real must, is equally well thought out. It features an anodized aluminum housing, "O" ring, allen screws, and replaceable filters.



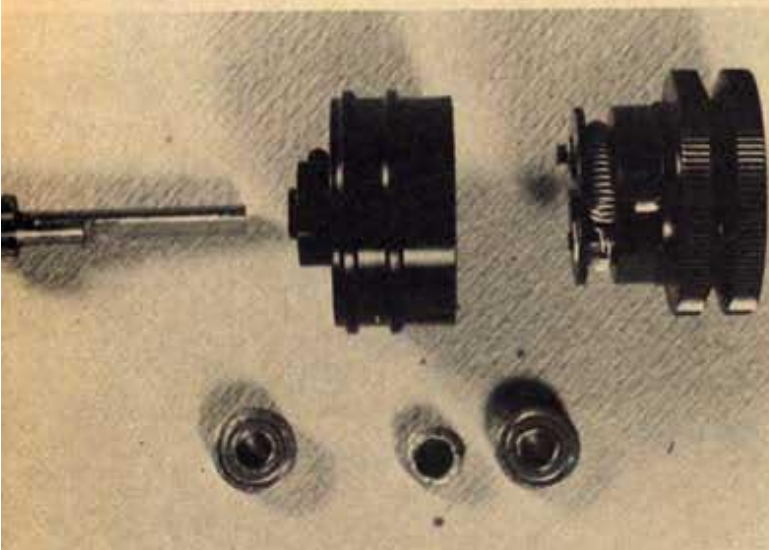
The exhaust system may not be by Abarth, but it's made for your engine and works trouble free.



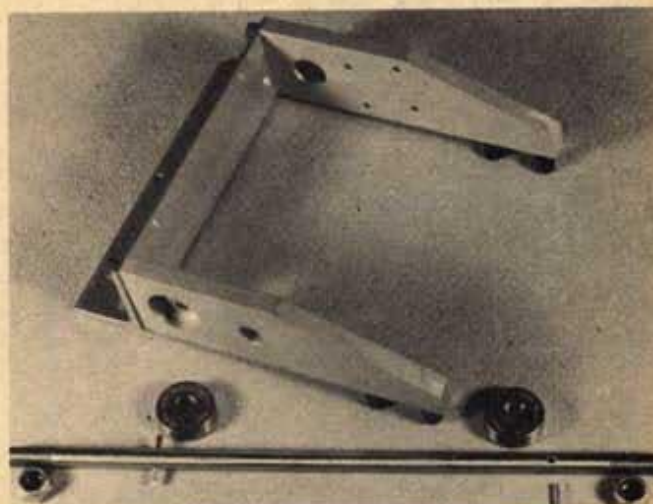
The fuel tank is shown here, with three lines properly installed, plus in-line filter.



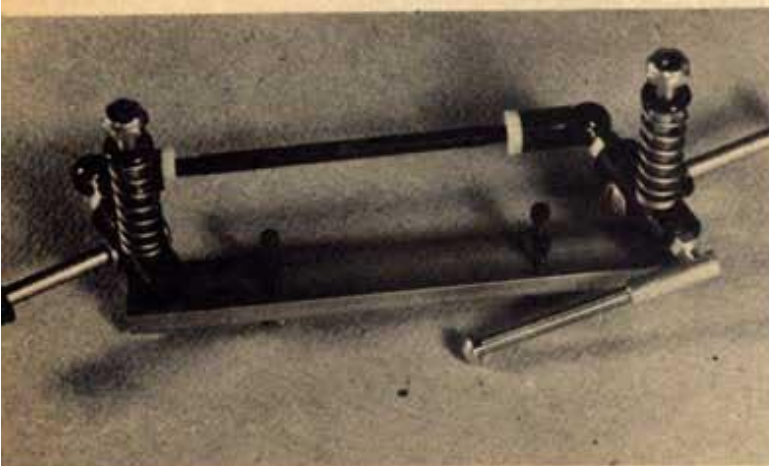
Those fabulous sponge tires are shown mounted, trued, and shaped. They come in two hardnesses. The rears are super soft. Wheels are unbreakable nylon.



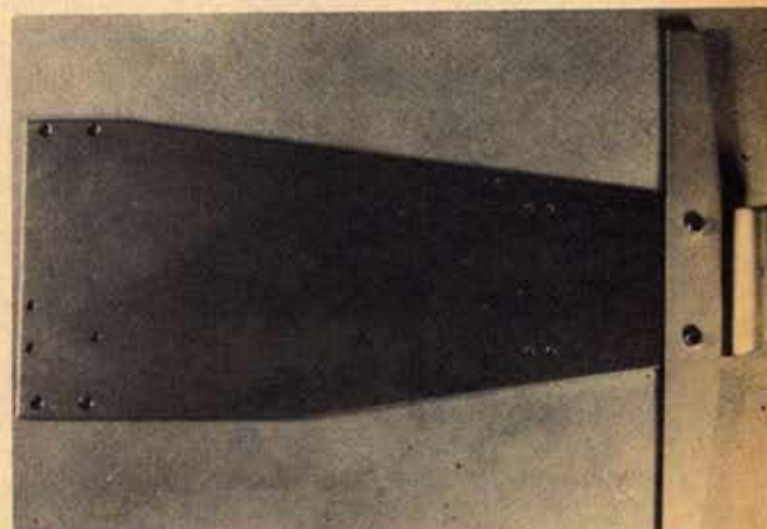
This is the fabulous Delta clutch/brake assembly you've heard about. Gears, 5:1 Nylatron and steel.



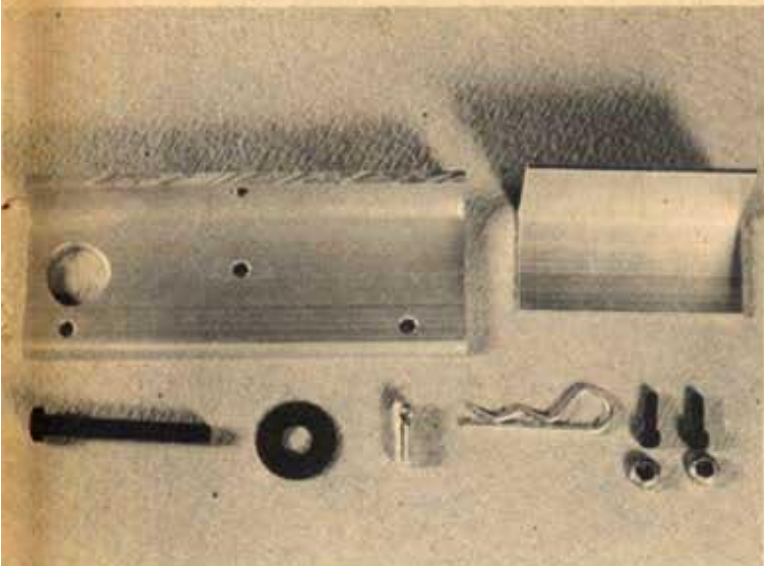
And this is what they mount into, the "Power Pod." Complete with 5/16" rear axle, it is one of the strongest in the game, with sealed ball bearings.



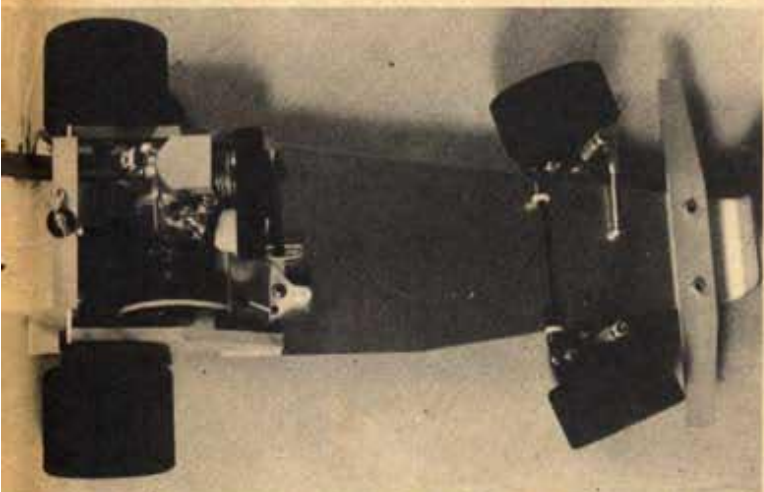
The front suspension unit is a homebuilder's delight, and I recommend it highly for that type of construction.



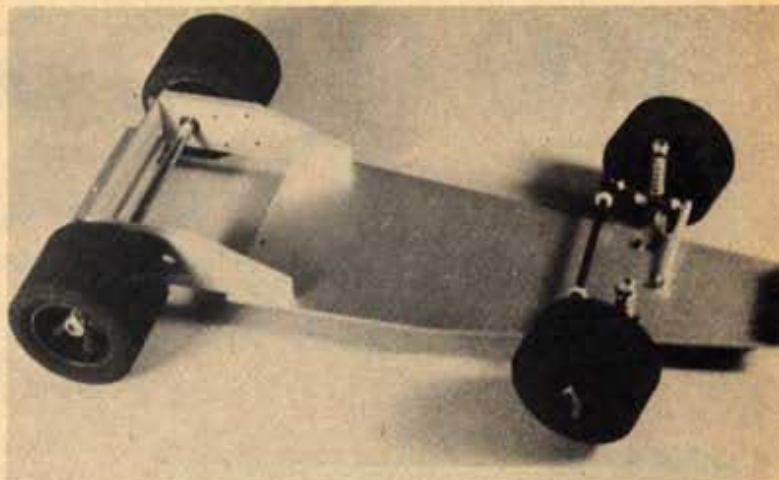
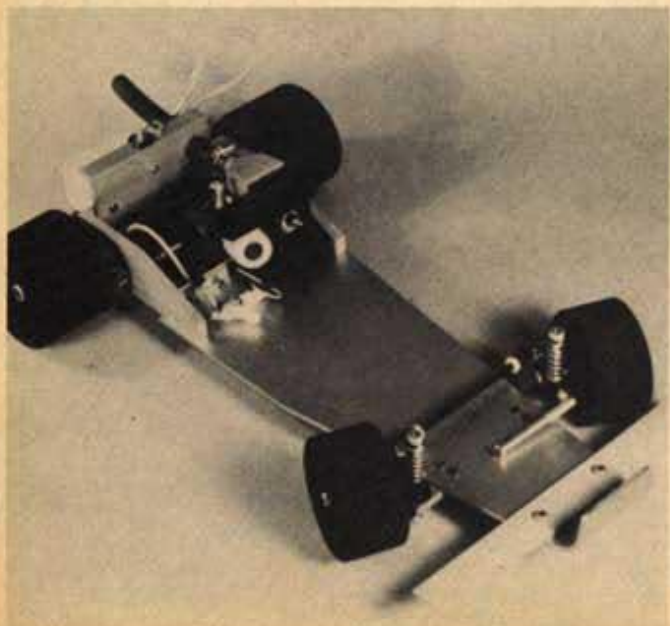
Everything shown so far mounts on this, the strongest plate-type chassis made, 1/8" thick anodized aluminum, pre-drilled and tapped.



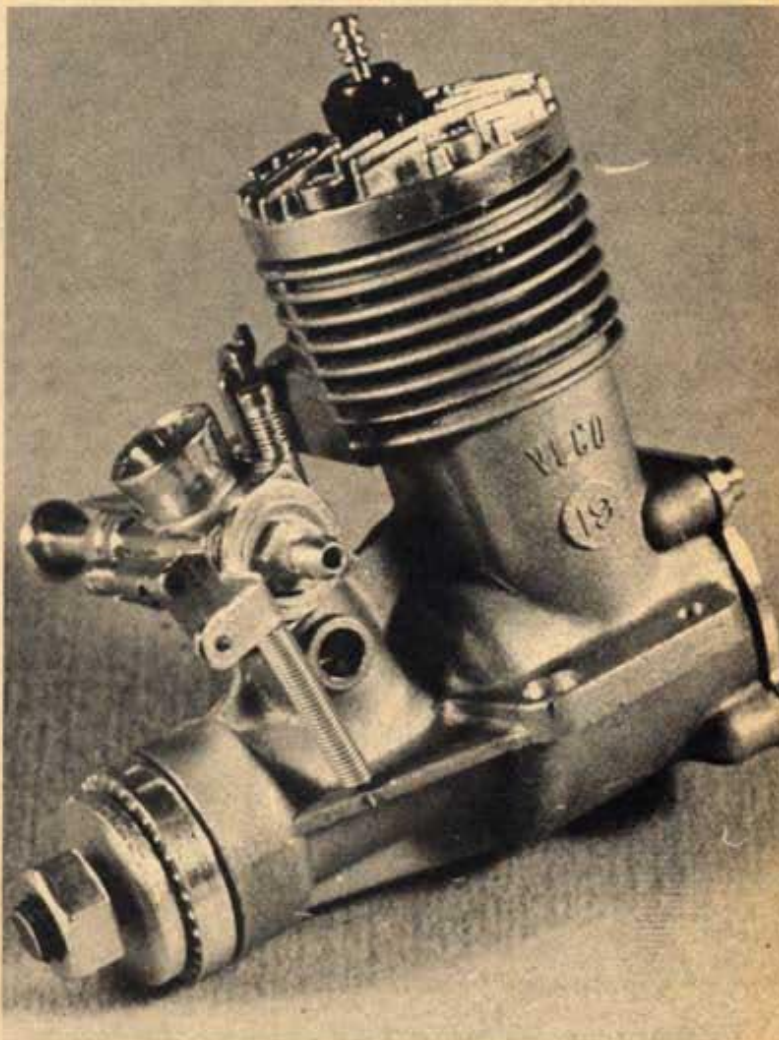
The body mounting kit, again standard.



Any way you look at it, it's great. The turned up nose is new on this model and really adds strength where it's needed. This plus the bumper bar should make you nerf king of the local parking lot.



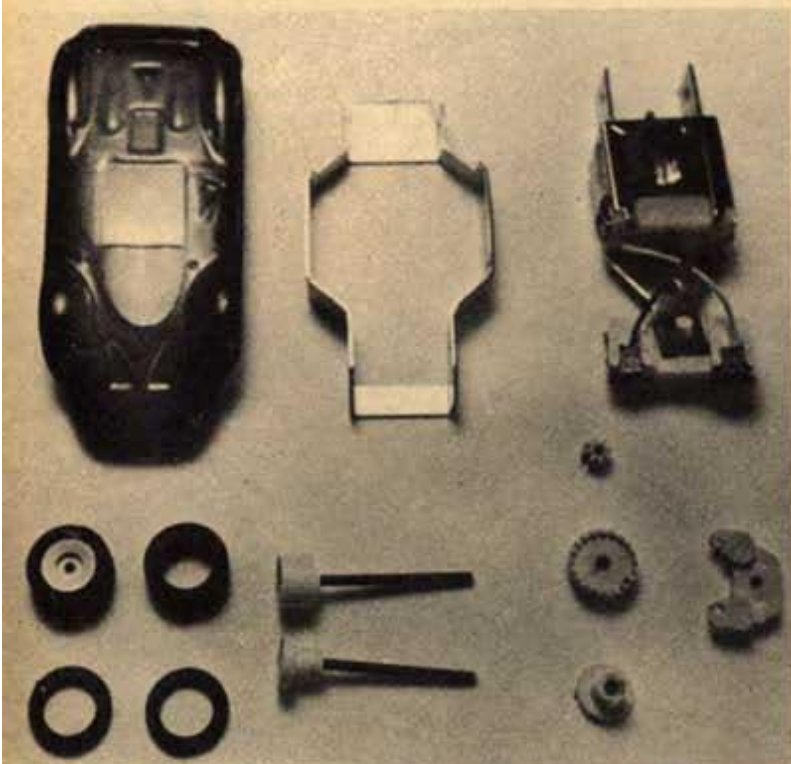
If you follow the instructions properly, you have to end up with this, the Delta Dash II D, ready for radio gear (left out here so you can really see how the chassis and running gear go together).



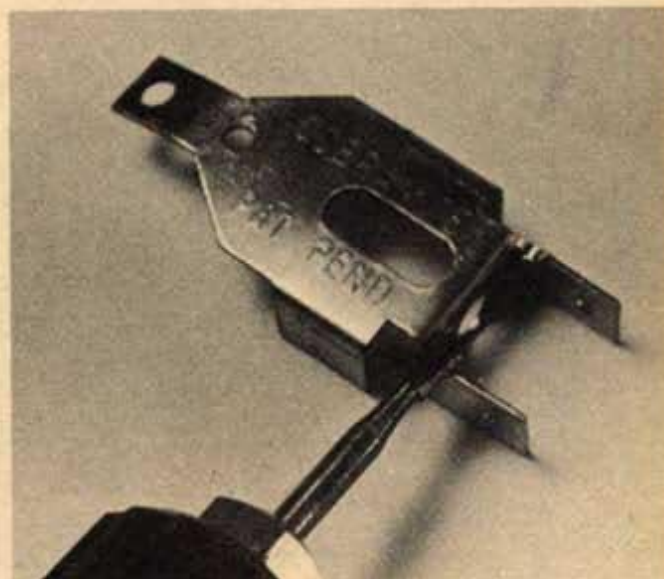
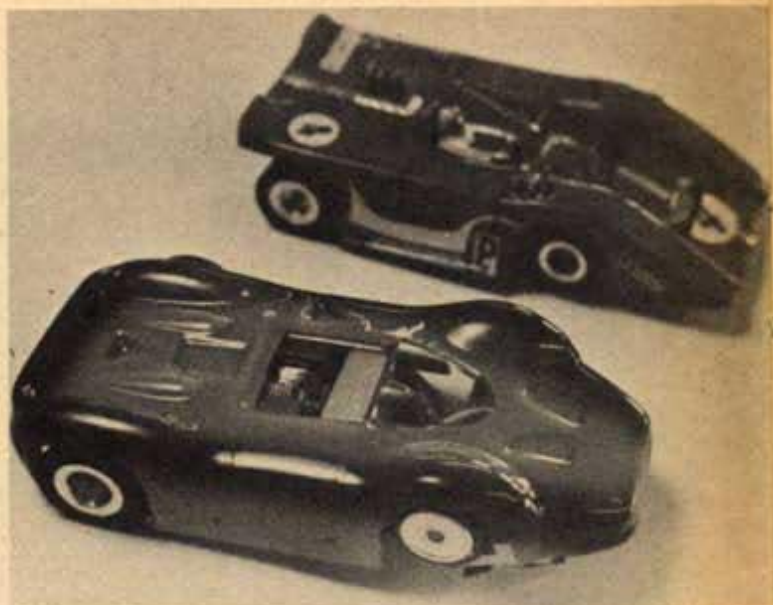
For those of you who have been worrying about those engine modifications, cool it. What you see here is all that's done. Reverse the position of the needle valve, add return spring to throttle arm, and relieve front web on block to allow exhaust mounting.

HO MODS ON A BUDGET

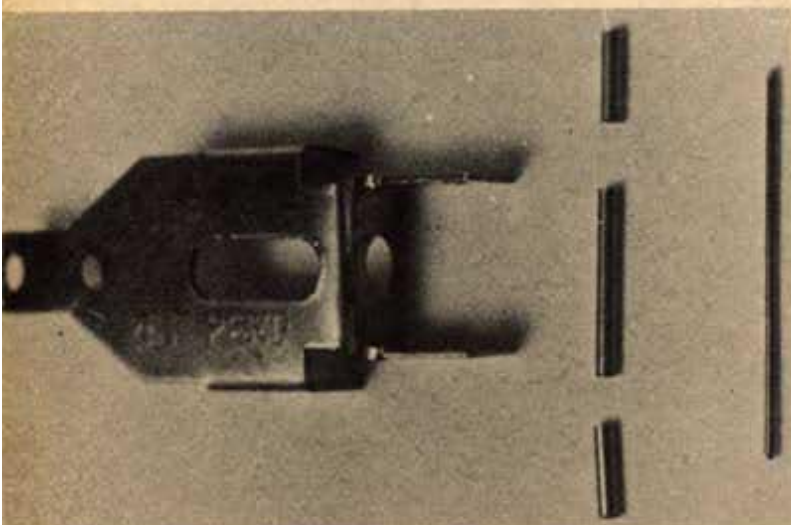
By Philippe de Lespinay



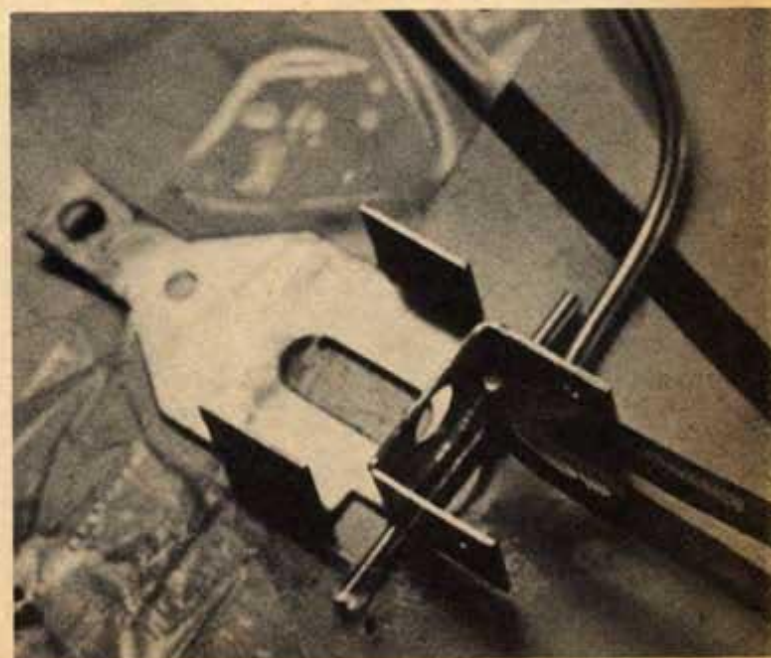
Disassemble the stock Cobramite to become familiar with it.

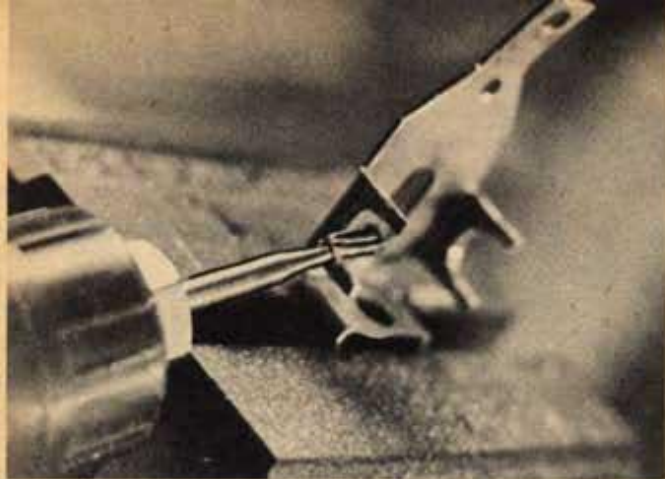


Grind two half circles where the rear pivot tubing will go.

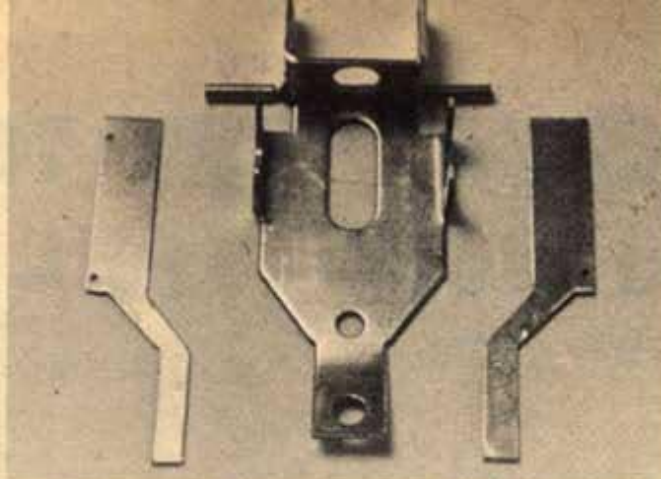


A piece of 1/16" tubing should be cut into three pieces, as shown here. Slip a piece of piano wire through all three pieces. Then solder the center tube (only) to the back of the chassis.

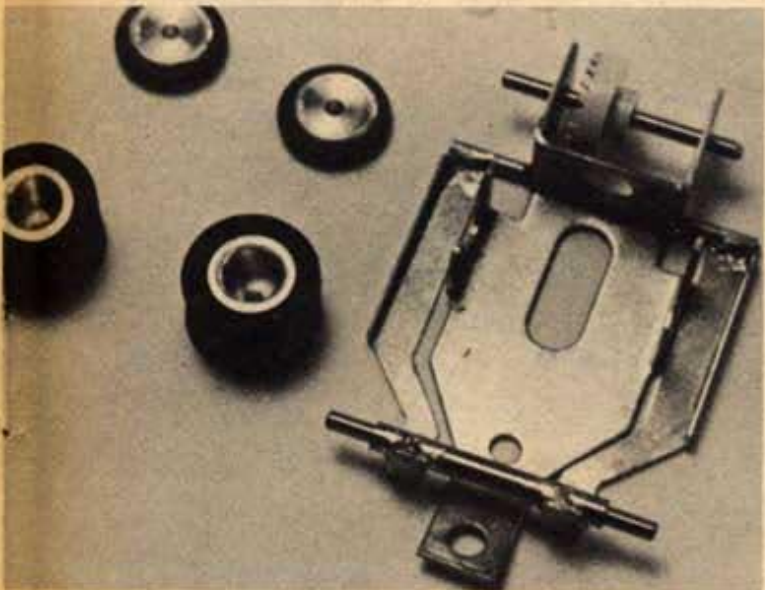




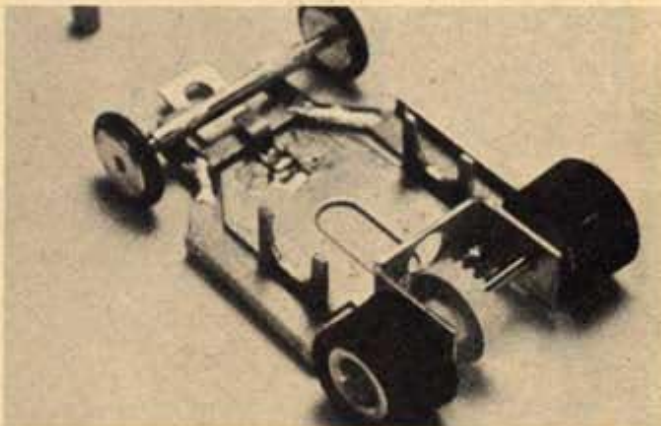
Lighten the side motor tabs with a Moto-Tool or file. Grind large half-circles in the brass, as shown here.



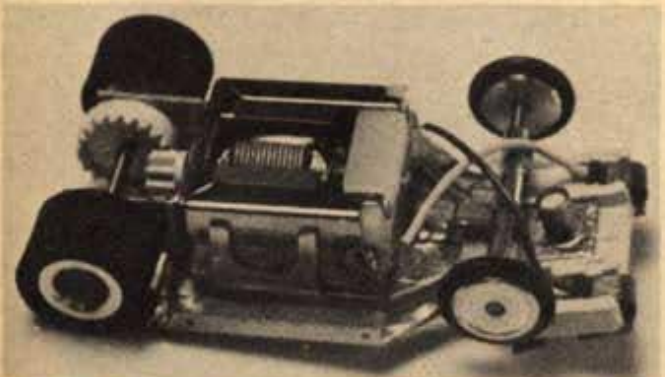
The two side panels should be cut as shown. Drill two holes in each side, where shown. Fold these two sides upright so they form a 90° angle. The holes should be drilled just the right distance apart needed to match a wire staple from a desk-type stapler. (This staple will be used to mount the body by inserting the sharp ends through the clear plastic body, and through the brass side panels, then folded over.) The front of each side panel (bottom of picture as you look at it) will also have to be bent in an upright (90°) vertical position. The front axle tube will be soldered to these vertical tabs.



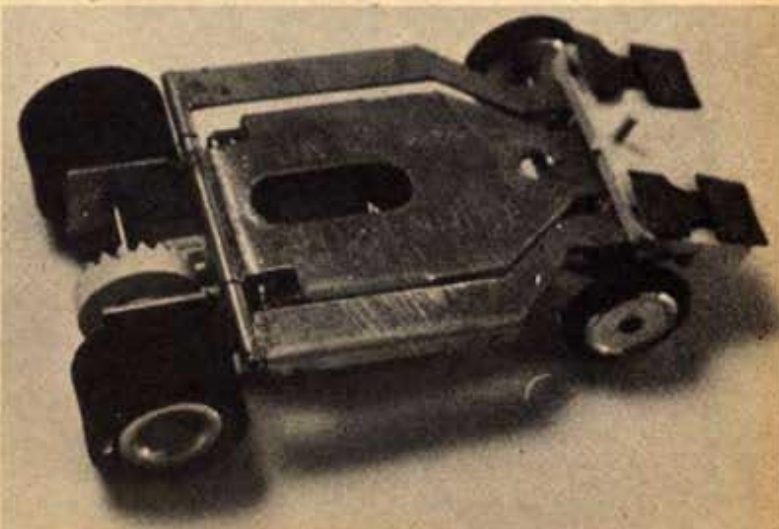
After carefully placing the folded pans on each side of the main chassis, solder the back of each pan to the outer cross tubes. Slip an axle in place, front and rear. Slip wheels on the axles (so the chassis is the correct distance off the track) and solder the front axle tubes to the upright tabs. The distance between the front and rear axles must be the same on the left side and right side of the chassis. If they're not, you'll have to unsolder the pans at the back of the chassis, slide them a bit until the distance is the same on both sides, and resolder.



Cut this piece of tubing to act as a bearing for the pickup shoe shank. Also cut a piece of lightweight brass plate and position it across the space between the outer pans. Solder both in place. The plate will act as a down-stop; the tubing will keep the pickup shoe in a perfectly vertical position and remove slop. Bend and solder another piece of plate to act as the actual downstop. Solder in place.



Mount the stock motor (or Mura replacement, if you prefer) and the wheels, axles, etc., for the final time. Glue the stock tires to the hubs and true up with fine sandpaper. The finished Cobramite is a real hustler, and the cost was well under a dollar.



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